LEARNING-OUTCOME CORRELATES OF EMOTIONAL PRESENCE IN INQUIRY LEARNING AMONG JAPANESE UNIVERSITY STUDENTS

高等教育における探究学習の情動存在性(EMOTIONAL PRESENCE)と学習成果との関連の実証的検討

A Dissertation Presented to
the Graduate School of Arts and Sciences
International Christian University
for the Degree of Doctor of Philosophy

国際基督教大学 大学院

アーツ・サイエンス研究科提出博士論文

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TAN, Siaw Eng

タン　シアウ　エン

審査委員会メンバー
Members of Evaluation Committee

主査 / Chief Examiner
　JUNG, INSUNG　教授

副査 / Examiner
　笹尾　敏明　特任教授

副査 / Examiner
　LANGAGER, MARK W. 上級准教授

Dedication

This dissertation is dedicated to my loving God

only in Your embrace have I sheltered

and on Your wings have I soared.

Special dedication extended to my parents

whose lives have been a great example

of love, courage, and tenacity.

On this foundation I stand

to weather life's obstacles and storms

and be a positive force for the world.

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Abstract

Inquiry learning has, until now, been widely viewed as a learner-centered approach that is key to academic success in higher education. However, research has not addressed the role of emotional presence in inquiry learning. Based on Dewey's theory of inquiry, epistemic emotion is viewed as a vital factor in inquiry learning. The current research argues that emotional presence plays an important role in the epistemic engagement of inquiry learning. Despite the establishment of the *Community of Inquiry (CoI) framework*, a prominent theoretical model that describes heuristic educational experience in a CoI, the model was criticized as being deficient in describing the affective domain of learning. The framework underscores three crucial learning constructs essential for building a successful and dynamic learning community: teaching presence, social presence, and cognitive presence. Unfortunately, to date, the framework has failed to consider emotional presence as one of its constructs.

Past work has attempted to call for the inclusion of emotional presence to be a part of the framework by demonstrating its existence in text-based online discussions. In addition, research of scale construction has been conducted to assess emotional presence. It is not clear, however, on what or why the theoretical base of the concept of emotional presence was founded upon, and as a result, varying concepts of emotional presence, as well as measurement tools emerged from differing studies. Moreover, crucial issues related to psychometric properties were found.

The current research sought to address these gaps and issues by conceptually specifying and empirically testing the construct of emotional presence in inquiry learning within the higher education setting. In three studies, this research aims to explore the underlying dimensions of emotional presence, examining its changes and effects on the learning process and outcomes, and identify relationships among the three CoI presences.

In Study One, the underlying dimensions of emotional presence were ascertained through a scale development study using a multi-institutional sample of Japanese universities (n = 361). Four dimensions of emotional presence were proposed based on a popular appraisal theory of emotions, known as the Cognitive-Motivational-Relational theory (CMRT) of emotion. A literature review and interviews resulted in the development of an initial 41-item of Emotional Presence Scale. Employment of Exploratory and Confirmatory Factor Analysis produced a final 16-item Emotional Presence Scale with adequate psychometric properties. The four dimensions were *interest-curiosity, emotional awareness*, *expression management,* and *emotional regulation.*

In Study Two, the change of emotional presence and learning-outcome correlates was assessed using a quantitative study of paired *t*-tests (n = 33) and correlational analyses in an inquiry learning activity. The results confirmed that emotional presence was dynamic in nature, increasing over two-time measurement points. Correlational analyses found that the increase of emotional regulation was positively associated with knowledge acquisition and direct task output rating. New insights into the causes and effects of emotional presence's changes were explained.

In Study Three, the relationships among emotional presence and three CoI presences were investigated using a quantitative study in an inquiry based online discussions of a university course (n = 126). Correlational analyses showed that emotional presence was significantly correlated with all three CoI presences, where the strongest correlation was found with cognitive presence. At the dimensional level, interest-curiosity was found to be a crucial component in the development of cognitive presence, while transcript analysis of online discussions confirmed these findings. In line with predictions, this study found that the higher a group predicts the level of emotional presence, the higher the level of attainment in knowledge construction. Multiple regression analyses further

demonstrated that emotional presence was the strongest predictor of cognitive presence. Drawing from the evidence, the role of emotional presence as both a navigator and motivator in epistemic engagement of knowledge construction was deduced.

This research has made important theoretical contributions in understanding the concept, nature, and role of emotional presence in inquiry learning of higher education. Practical implications on fostering emotional presence of learning design to enhance the epistemic engagement in the process of learning have been outlined. This research recommends emotional presence be integrated as one of the fundamental elements of the CoI framework. Future research directions are specified with a focus on replicating the results in diverse learning contexts and learners, with suggestions to explore emerging themes of emotional safety in online discussions, as well as the mystique surrounding emotional awareness.

要旨

従来、探究学習は高等教育における学業成功への鍵となる学習者中心のアプローチとして広く捉えられてきた。しかし、先行研究では探究学習における情動存在性(emotional presence)の役割については取り上げられていない。ドューイの探究理論に基づき、認識的情動（epistemic emotion）は探究学習において重要な要素であると考えられている。本研究は情動存在性が探究学習の認識的関与において重要な役割を果たすと主張している。探究の共同体（Community of Inquiry、以下 CoI とする）における発見的教育体験を説明する著名な理論モデルである CoI フレームワークが確立されたにも関わらず、このモデルは学習の情動領域の記述が不十分であると批判された。CoI フレームワークは良好で活動的な学習共同体を形成するために不可欠な三つの重要な学習構成概念、すなわち教授存在性（teaching presence）、社会存在性（social presence）、認知存在性（cognitive presence）を強調している。しかし残念ながら、現在までのところ、CoI フレームワークにおいて情動存在性がその構成概念の一つであると考えられていない。

これまでの研究では、テキストベースのオンライン・ディスカッションにおける情動存在性を論証することで、情動存在性が CoI フレームワークの一部であるべきだと提唱することを試みている。また、情動存在性を評価するために尺度構成の研究も行われてきた。しかし、情動存在性の概念の理論的基礎が何なのか、またなぜ構築されたのかはまだ明らかでなく、その結果、情動存在性の概念は多様化し、数ある研究から様々な測定ツールが生まれている。また、心理測定特性に関連する極めて重要な問題も見つかっている。

これらの研究課題と問題を解決するため、本研究は高等教育の場での探究学習における情動存在性を概念的に特定し、実証的に調査することを目的とした。まず初めに情動存在性の基礎的な次元を調査し、次にその次元がどう学習プロセスと学習成果に影響するか検証し、最後に三つの CoI プレゼンスとの関係性を解明することであった。

研究１では、日本の大学の複数機関のサンプル（n = 361）を用いた尺度開発研究により、情動存在性の基礎的な次元を明らかにした。情動存在性の四つの次元は、認知的動機付け的関係性理論（Cognitive-Motivational-Relational 理論、または CMR 理論）として知られ、広く普及している感情の評価理論をもとに提示された。文献レビューとインタビューを元に、初期の４１項目の情動存在性尺度を作成し、その後、探索的因子分析と確認的因子分析を用いて、適切な心理測定特性を持つ１６項目の情動存在性尺度を示した。四つの次元は興味―好奇心、感情認識、表現操作、感情調整であった。

研究２では探究学習活動においての情動存在性の変化と学習成果の相関関係を、量的調査である t 検定（n = 33）と相関分析を用いて測定した。その結果、情動存在性は動的な性質であることが確認された。また相関分析の結果、感情調整の増加は知識習得や直接的なタスクアウトプットの評価と正の相関があることがわかった。情動存在性の変化の原因と結果についての新たな知見が説明された。

研究３では、情動存在性と三つの CoI 存在性との関係性を調査するため、大学の授業での探究型オンラインディスカッション（n = 126）において量的調査が用いられた。相関分析の結果、情動存在性は三つの CoI 存在性全てと有意な相関を

示し、中でも最も強い相関は認知存在性とともに見出された。この様相においては、興味―好奇心は認知存在性の発達において重要な構成要素であると判明し、オンラインディスカッションの転写解析はこれらの発見を裏付けた。予測に沿って、本研究はグループが情動存在性のレベルを高く予測すればするほど、知識構成の達成度が高くなることを見出した。回帰分析では、情動存在性が認知存在性の最も強い予測因子であることが示された。この証拠から、情動存在性は知識構成の認識的関与において、誘導要因ならびに動機付け要因としての役割を果たしていることが推測された。

本研究は高等教育の探究学習における情動存在性の概念、性質、役割の理解において重要な理論的貢献を果たしている。情動存在性を育む学習設計を構成することにより、学習プロセスでの認識的関与を促進できるという実用性を示した。本研究はCoIフレームワークの基礎的な要素の一つとして情動存在性が統合されるべきだと推奨するものである。今後の研究の方向性としては、本研究の成果を多様な学習環境や学習者で再現することに重点を置き、オンラインディスカッションにおける感情的安全性や感情的認識といった比較的新しく、掘り下げられていないテーマを研究する必要性が考えられる。

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Chapter 1: Introduction

Chapter 1 discusses the background, problem statement, research purpose, and the significance of the current study. Firstly, the background of inquiry learning, emotion and emotional presence (EP) in education will be introduced: relevant theories, concepts and definitions will be presented, including the Community of Inquiry (CoI) framework and the cognitive-motivational-relational theory (CMRT) of emotion. Following on, the problem statement will address the research gap identified from reviewing previous studies, with particular focus on the theoretical base of EP and the CoI framework. Next, the purpose of the current study will be presented, and possible contributions of the research will be discussed from both theoretical and practical perspectives.

Background of the Study

Inquiry learning has, for a considerable time, been practiced in a wide variety of teaching and learning contexts in higher education. Inquiry learning, also known as 'inquiry-based learning' or 'inquiry-guided learning' has its root in social constructivism. According to the *theory of inquiry* of Dewey (1938), inquiry learning originates from one's interaction with the environment in a natural way to resolve uncertainties. Epistemic emotions such as curiosity are viewed as one of the most crucial emotions that drives inquiry learning for knowledge construction and generation. Research indicated that epistemic emotions are predictors of deep learning strategies, knowledge exploration and construction.

In accordance with social constructivism theory, inquiry learning is inherently social, where learning takes place among a community of learners through collaborative knowledge building. Commonly called a community of inquiry, or *CoI*, it refers to a group of learners committed to actively building knowledge through purposeful social interaction and meaningful negotiation. Within the CoI, it is believed that various learning constructs

interact together to form a dynamic educational experience. These constructs have been outlined in a widely researched framework called the 'Community of Inquiry Framework', included are teaching presence (TP), social presence (SP), and cognitive presence (CP). The CoI framework was developed by Garrison et al. (2000) as a model to articulate processes crucial to foster epistemic engagement through the cultivation of the three CoI presences in the online and blended learning environments. There are two main approaches regularly used to assess the CoI presences. One is a 34-item CoI survey developed by Arbaugh et al. (2008) which was used to assess learners' perceptions on online or blended learning experiences through a five-point Likert scale rating. This survey was widely adopted by researchers and has been reported to have adequate reliability. The other approach is a coding scheme used to code online discussion transcripts into the three CoI presences and their constituting dimensions. The coding scheme was originally developed by Garrison et al. (2000) with subsequent modifications made by several studies to suit individual contexts. The coding scheme used in Study Three of this research is a combination of codes adopted from several studies appropriate to the context of the current study. More details about the coding scheme are to be found in Chapter 5 (Study Three). Both instruments are included in Appendix I and Appendix L respectively.

While the CoI framework is recognized as one of the most established models, the limitations of the model have been identified by certain studies. One area most mentioned is the missing component of the affective domain, known as 'emotional presence' (EP). Whilst compelling evidence pointed to the importance of EP in inquiry learning, research undertaken in this area is still rather sparse.

Research into emotion in education has largely established the role of emotion in learning. Emotion has been found to play several roles, among which are the enactment of emotional and learning regulation; building positive interpersonal relationships with

instructors or peers; or in a negative manner, a distractor to learning. Most studies typically conceptualize emotion as a form of *discrete feeling*, such as anxiety, enjoyment, frustration, and confusion.

The concept of emotion in the form of 'presence', which is essentially *emotional presence*, is still under-investigation (Cleveland-Innes & Campbell, 2012; Jiang & Koo, 2020). In brief, EP refers to the 'experience of emotion', which is different from the limited concept of discrete feeling. Past work on EP was largely confined to exploring the existence of EP in asynchronous online discussions, and by and large, these studies were able to display the existence of EP and three CoI presences in online discussion transcripts. However, the concepts of EP employed varied widely from study to study, with EP being conceptualized variously, from 'the outward expression of emotion', to 'emotional intelligence'. The variety in the concept of EP led to the variation in instruments developed to measure EP, from among these, the most widely adopted EP instrument was a scale developed by Cleveland-Innes and Campbell (2012). The six-item scale measured EP as an expression of emotions between the instructor and learner. Cleveland-Innes and Campbell's (2012) study was the only study that attempted to prove EP a separate construct from the three CoI presences (i.e. TP, SP, and CP) using exploratory factor analysis (EFA). The authors led the call for the inclusion of EP as part of the CoI framework.

Other than that of the above, there is a dearth of research into EP with other learning variables. Jiang and Koo (2020) explored the effects of EP on online learning satisfaction and EP was identified to be a significant predictor. In addition, age and gender were found to be uncorrelated to EP. So far, no studies have been found which explore the interaction of EP within the CoI framework.

When considering the theoretical base of EP, some studies grounded EP on the theory of emotional intelligence, while some did not even report it. In the current study, the researcher believes that EP should be grounded on the theory of emotion; and from the many existing theories of emotions, the cognitive appraisal theory has become the base of EP in this study. The line of cognitive appraisal theory has become the most popular and widely accepted theory of emotions because it can explain the differentiation between emotions. Central to any discussion on the cognitive appraisal theory is the CMRT of emotion. This theory was developed by Lazarus (1966; 1991b), in brief, describes the occurrence of emotions as a process which happens as a result of ongoing adaptation between a person and the environment. There are three main areas related to the occurrence of emotion: cognitive appraisal, emotive experience, and emotional regulation. Under these three headings, the researcher identified four dimensions related to the experience of emotions in the context of CoI, which are epistemic emotive experience, emotional awareness, emotional expression, and emotional regulation.

Problem Statement

Emotions are viewed as a vital factor in inquiry learning. In particular, epistemic emotions such as curiosity are viewed as a crucial element in knowledge exploration and generation, a process essential to inquiry learning. However, past research on emotion in education has been limited to explaining the role of discrete emotions according to their valence (positive or negative emotions), and types (e.g. achievement emotions, activity emotions). Such conceptualization is lacking a broader perspective because the experience of emotion is not limited to discrete feelings only. The experience of emotion encompasses individual and social dimensions, and emotional occurrences often arise from social interactions with the community (Greenaway et al., 2018; Niven, 2017).

It is, therefore, unclear how the whole process of experience of emotion interacts with other learning elements in the inquiry learning process. Unfortunately, the CoI framework which has been acknowledged as 'the most concise descriptive model' that describes the higher educational experience of inquiry learning has not sufficiently considered EP as a part of the experience. Despite compelling evidence suggesting that EP is ubiquitous in a CoI that exists alongside the known CoI presences, past investigation in this area has been insufficient. Neglecting EP in the research of educational transactions within a CoI surely fails to capture the entirety of a dynamic and complex educational experience.

The central issue to arise from past studies on EP is the lack of a sound theoretical base for EP itself, which subsequently affects the conceptualization of EP. Cleveland-Innes and Campbell's (2012) six-item survey generally measures EP in terms of the expression of emotions in text-based discussions. The concept is a narrow view of EP because it has neglected the intrapersonal sphere of the experience of emotion which may not be observed in text discussion. Moreover, another study (Kang et al., 2007) chose the concept of emotional intelligence to define EP. This concept raises more questions on how EP could be regarded as a form of intelligence, apart from the issue of conceptual redundancy. On top of that, various issues related to psychometric properties of the EP scale development were found. Whilst these scales might be useful for a particular context, it remains questionable as to their adoption in other studies.

Research Purpose

Addressing knowledge gaps, this research examines the concept and underlying dimensions of EP as a key construct of the CoI in higher education context. To this end, an instrument called Emotional Presence Scale (EPS) was constructed and validated to measure EP. Using the EPS, this research explored the dynamic transaction of EP in an

inquiry learning activity through exploring the change of EP over time. In coherence with the CMRT of emotion which states that the dynamicity of emotion is closely related to one's adaptation to an encounter, this research attempts to uncover how EP change is related to learning adaptation, as well as knowledge acquisition and task outcomes. Finally, this research examined the dynamic interplay between EP and three CoI presences in an inquiry-based online discussion. The aim of which was the development of a conceptual model incorporating the four constructs, EP, TP, SP, and CP in explaining how learning happens within the interconnectedness of these presences.

Significance of the Study

It is hoped that this research will contribute to the growing area of research relating to the CoI by advancing the understanding of the concept and dynamicity of EP and demonstrating the underlying dimensions of EP through the lens of the CMRT of emotion. Additionally, through exploring EP dynamicity in relation to learning adaptation, it will bridge the understanding between what transpires during the learning process to the outcomes. Further, it offers important insights into understanding the relationships between EP and the three CoI presences and its constituting dimensions for collaborative knowledge construction. It is set to improve the existing CoI framework that encompasses the three original key constructs of TP, SP, and CP, into a more comprehensive framework describing learners' educational experience with the addition of EP. It is hoped that it will also deduce the role of EP and revisit the role of the three CoI presences in the new framework.

As for the practitioners, EPS may serve as a useful instrument to assess learners' EP level to understand its changes and effects in an inquiry learning activity. It will provide an opportunity for instructors to assess pedagogical practices of the learning activity and evaluate potential strengths or pitfalls that could influence learning processes

and outcomes. The new framework, it is hoped, will reveal the role of instructor on which 'presence' should be nurtured to promote successful epistemic engagement within a CoI. Moreover, this framework which outlines the interconnectedness of the four presences will inform future instructional designers of how learning designs in discussion platform could enhance the development of a certain presence to build dynamic learning experiences.

Definition of Key Terms

Cognitive presence. The extent to which learners are able to construct and confirm meaning through sustained reflection and discourse (Garrison et al., 2001, p. 11).

Community of inquiry. A group of individuals who collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding. (Garrison, 2011, p.2).

Emotional presence. The experience of emotion during the ongoing interaction between a learner and the situated learning environment in the epistemic engagement of learning.

Social presence. The ability of learners presenting themselves as 'real' people in the community of inquiry (Garrison & Akyol, 2012, p.107).

Teaching presence. The design, facilitation, and direction of cognitive and social presences for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes (Garrison, Anderson, & Archer, 2000, p. 5).

For a list of abbreviations used, please refer to Appendix A.

Chapter 2: Literature Review

Chapter 2 presents the literature review of inquiry learning and related theories; the CoI framework; EP in education; and the theoretical base of EP. It goes on to highlight the gaps in EP studies and presents the conceptual framework of this research, finally laying out the research questions, followed by a brief explanation of the structure of this research.

Inquiry Learning

Concepts and Definitions of Inquiry Learning

The term 'inquiry learning' is used interchangeably with 'inquiry-based learning', 'inquiry-oriented learning', and 'inquiry-guided learning' throughout the literature, while various definitions of inquiry learning are to be found. Harada and Yoshina (2004) defines inquiry learning as 'a pedagogical approach that engages learners actively in a knowledge-building process through the generation of answerable questions'. Inquiry learning has also been used referring to 'a range of instructional practices that promote learning through learner-driven and instructor-guided investigations of learner-centered questions' (Justice et al., 2002, 2007). In short, inquiry learning is a process of acquiring deep learning in searching for truth, knowledge, or new understanding (Spronken-Smith et al., 2007).

Past work has highlighted the importance of inquiry learning in promoting new knowledge acquisition and its generation, abilities (such as asking good questions, interpreting evidence) and attitudes (such as being a lifelong learner) (Lee, 2011, 2012). It is viewed as a dominant pedagogy for higher education that places emphasis on learner-centered instruction (Fowler et al., 2012; Justice et al., 2002; Justice et al., 2007, Lee, 2012).

Theories of Inquiry

Inquiry learning has its theoretical roots in constructivism, pragmatism, and the experiential learning theory, where the ultimate goal is to construct meaning in learning

(Bruce & Bloch, 2013; Lee, 2011). Notable scholars of these theories include Piaget, Vygotsky, Freire, and Dewey; from among them, Dewey's theory of inquiry has been one of the most influential theories in education (Schön, 1992).

Dewey's Theory of Inquiry

Dewey, a proponent of pragmatism and constructivism, believes that the process of engaging in investigation of scientific inquiry (i.e. learning by doing) is more important than getting the end results (Dewey, 1938). He further emphasized that the construction of meaning or new knowledge happens as a result of the interaction between personal interests and social knowledge. Consistent with Dewey's theory, social constructivism proposes that learning is essentially social, and learning in a community enables one to go beyond the zone of proximal development, when compared to learning by oneself.

Community of Inquiry

The term *community of inquiry was* first coined by Charles Sanders Peirce, an American philosopher (Garrison, 2013). Also known as CoI in short, Peirce defined such a community as 'an intersubjective method of investigation, an evaluation and exchange of ideas among individuals invested in inquiry beyond any one personal investment' (Librizzi, 2017, p.6). Dewey, however, extended the CoI into the social problems within society and educational communities, where people engage in problem-solving together (Schön, 1992, Garrison, 2013). The CoI framework, which has its basis in community learning, is theoretically founded on Dewey's theory of inquiry and Vygotsky's social constructivism. Garrison (2011) defines CoI as 'a group of individuals who collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding' (p.2).

Community of Inquiry Framework

The CoI framework was developed by Garrison et al. (2000) as a theoretical framework for critical inquiry in online learning environments (OLEs) within a collaborative community of learners in the context of higher education. This framework is a prominent model and has been applied extensively by educational researchers to examine the dynamic interaction between three presences: TP, SP, and CP. The CoI framework is a *process* model, which focuses on understanding the interaction between the presences that form learners' educational experience (Akyol et al., 2009; Swan et al., 2009). It has a socio-constructivist orientation towards learning, which emphasizes learning interaction among a CoI (Akyol et al., 2009; Akyol et al., 2010; Swan et al., 2009). Figure 1 displays the elements of the CoI framework.

Figure 1

Community of Inquiry Framework

Notes. Source: CoI. (n.d.). *Community of Inquiry Framework.* https://coi.athabascau.ca/coi-model/

The framework has been used extensively by researchers as a tool to study the process of online learning; and later on, extended to study blended learning as well (Garrison & Kanuka, 2004; Garrison & Vaughan, 2008; Vaughan & Garrison, 2005). The publication of studies using the CoI framework has contributed significantly to understanding the dynamics of these presences in educational experiences in a collaborative CoI.

The concept of CP is grounded in the theory of inquiry and the reflective thinking model of Dewey (Garrison & Akyol, 2012). It refers to 'the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse' (Garrison et al., 2001, p. 11). CP itself consists of four dimensions (i.e. *triggering event, exploration, integration,* and *resolution*) which are four phases of the Practical Inquiry Model, reflecting Dewey's reflective inquiry concept (p.108). Critical thinking is an integral part of inquiry learning, through learners' reflection at the personal level and discourse among the community. This construct is considered the core of the framework, and past studies reveal that TP has a strong influence on CP (p.110).

TP refers to 'the design, facilitation, and direction of cognitive and social presences for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes' (Garrison, Anderson, & Archer, 2000, p. 5). TP encompasses *design and organization*, *direct instruction*, and *facilitating discourse*. It is regarded as the most crucial construct to enhance CP and SP (Garrison & Akyol, 2012, p.110). Studies reveal that an instructor or facilitator plays a crucial role in guiding, prompting, managing, and supporting the CoI, in addition to designing and delivering instruction (Garrison, Cleveland-Innes, & Fung, 2010; Shea & Bidjerano, 2009).

SP refers to 'the ability of learners presenting themselves as 'real' people in the community of inquiry' (Garrison & Akyol, 2012, p.107). The dimensions of SP are *open*

communication, *group cohesion*, and *affective expression*. Studies reveal that SP, by itself, may not be effective in enhancing cognitive development as the discourse may veer off from the intended purpose of inquiry (Garrison et al., 2000, p.95). SP was found to be playing the role of 'mediator' between TP and CP (Garrison, Cleveland-Innes, & Fung, 2010). TP is necessary for setting direction and climate of social presence for productive discourse.

Empirical Findings Underpinned by the CoI Framework. Researchers have shown great interest in the research of the CoI framework since its initial establishment in the year 2000. The body of literature surrounding the framework from 2008 numbered to over 200 articles (Stenbom, 2018). The researcher took a strategic approach, rather than an exhaustive one, in reviewing the areas of empirical findings which are related to this dissertation alone. Specifically, the area concerning the interrelationships among the presences, as well as with other learning variables were of the interest for the purposes of this dissertation.

On the relationship within the CoI presences, an initial study conducted by Akyol and Garrison (2008) found significant correlational relationships among the three presences, however, the study involved a very small number of participants (n = 15). Several other studies have since established the relationships between the three presences. For example, Archibald (2010) conducted a study on 189 university students who participated in an online discussion and discovered that TP and SP could significantly predict CP when CP was regarded as a learning outcome. Regarding correlational values, TP and SP were positively and strongly correlated with CP (r =.75 and r = .76 respectively); and TP was moderately correlated with SP (r = .65). The study employed standard and hierarchical multiple regression methods in the analysis phase. Similarly, taking CP as the learning outcome and by employing structural equation modelling (SEM)

analysis, Garrison, Cleveland-Innes and Fung (2010) found that TP had a direct effect on CP and SP had a mediating, indirect effect on CP.

Using a different analysis method, Kozan and Richarson (2014) explored the interrelationships among the three CoI presences. CP appeared to have a strong mediating effect between TP and SP. This result did not align with the finding of Garrison, Cleveland-Innes and Fung (2010) that SP played the mediating role between TP and CP. One possible reason being the type of analyses employed in both studies. This study employed a correlation methodology which was different from the SEM analysis conducted by Garrison, Cleveland-Innes and Fung (2010). However, in 2016, Kozan employed SEM analysis to analyze the relationships among the three CoI presences (see Kozan, 2016). The findings indicated that the model fit well when CP was a full mediator between TP and SP, or when SP was a partial mediator between TP and CP. The second fit model was consistent with Garrison, Cleveland-Innes and Fung (2010)'s findings. In conclusion, Kozan's (2016) findings showed that there could be more than one model explaining the causal relationships between the three CoI presences. Findings from these studies serves as an important guide for the current study, the aim of which is to explore the interrelationships between four presences (inclusion of EP) in Study Three later.

Some studies have explored the relationship between the CoI presences with learning outcomes. These studies typically found some kind of association does exist between CoI presence(s) with learning outcomes. Yussiff et al. (2018) conducted an experimental study to explore the causative relationships of collaborative learning experience on actual learning outcome through moderating effects of three CoI presences. Findings revealed that the CoI presences moderated the effects between e-collaboration and post-test scores.

A further study conducted by Rockinson-Szapkiw et al. (2016) on 131 online graduate students found that the three presences were significantly correlated with each other, and with course points. TP was found to be the strongest predictor of course points. Additionally, Yang et al. (2016) conducted a study on 26 graduate students and found that three presences together significantly predict the learning outcomes.

Inadequacy of the CoI Framework. Some scholars have highlighted the inadequacies of the CoI framework in neglecting the affective dimension of learning experience (Cleveland-Innes & Campbell, 2012). The existing CoI framework incorporated *affective expression* as a part of SP. This dimension assesses the sense of belonging and ability to form impressions for social interaction in a CoI, through expressing feelings, values, and beliefs. As such, this dimension differs from the concept of EP that refers to the experience of emotions in learning. Calls for the inclusion of another construct called *emotional presence* into the CoI framework had been put forth in two studies: Cleveland-Innes and Campbell (2012) and Stenbom, Hrastinski, and Cleveland-Innes (2016). They revealed, through transcript analysis, that emotional elements were present in online discussions.

Emotion and Emotional Presence in Education

Emotion in Education

Research on emotion in education (or also known as academic emotions) has typically focused on discrete feelings (such as enjoyment, anxiety, boredom etc.) experienced by learners. The role of emotion in education was one of the main areas of interest in past studies. Through exploring the antecedents of emotions and effects of emotions on other variables, researchers found several important roles of emotion in education.

The Role of Emotion in Education

Both in the face-to-face (f2f) and OLE, research has identified various roles of emotion. Indeed, emotion plays an important role in the enactment of useful learning strategies (e.g., Muis et al., 2015) and emotional regulation strategies when encountering a difficult subject (Marchand & Gutierrez, 2012). However, results between the f2f and OLE were somehow different. For instance, frustration was found to predict emotional regulation strategies of the f2f setting but not the OLE. One possible reason for this is that the OLE might better support adaptive emotional regulations where learners could have more opportunities to reflect on the situation. Regarding learning strategies, Muis et al. (2015) discovered that positive epistemic emotions could evoke deep learning strategies.

Emotions are key to social interaction and relationship building (Derks et al., 2008; Lehman, 2006). Studies have shown that emotions are important in building the dynamic between instructor and learner. Learners who enjoyed relating to their instructor revealed that they felt appreciated and were reportedly more involved in learning activities (Furrer & Skinner, 2003, p.159). Instructor support, including positive emotional support, has been found to be associated with learners' motivation (Meyer & Turner, 2002; Meyer & Turner, 2006). Lower exchanges were found to be associated with lower learner involvement and learning goals (Meyer & Turner, 2002). Learners often perceive that the instructor to be the main source of 'strong, intense, and frequent' cause of emotions (Hascher, 2010, p.17). As for peer relationships, positive emotions were reported to be important for building social dynamics during interaction (Wosnitza & Volet, 2005). In contrast, negative emotions could cause tension and dissatisfaction among learners, and affect cooperation among peers.

However, not all the roles played by emotions were beneficial to learning. Negative emotions could play the role of *distractor* to learning. For instance, anxiety can lead to the

impairment of performance (Cassady & Johnson, 2002; Chapell et al., 2005; Chin et al., 2017; Zeidner, 1998) because it consumes working memory that eventually lowers cognitive resources for information processing. The subject allocates more attention on the object of emotion which is task-irrelevant and adds to the cognitive load of working memory. This leads to the deficiency in information processing that is essential for task completion (Sweller et al., 1998; Zeidner, 1998). On the other hand, one might think that positive emotions such as relief are beneficial to learning and achievement. This is an exception because relief is found to be correlated positively with task-irrelevant thinking and distraction in learning (Pekrun et al., 2002). This indicates that positive emotions may also become a distractor that bears negative motivational effects on learning and achievement.

Emotional Presence in Education

In the book *Varieties of Presence*, Alva Noë, a philosopher and researcher about perception and consciousness, contended that the world we are living in is like a framed painting, with no meaning to us until we 'show up' to it (Noë, 2012). The degree of our *experience* is how much the world 'shows up' to us. Experience is achieved through our perceptual relation to the world (p.2). In Noë's own words, '*Perception is a transaction; it is the sharing of a situation with what you perceive*.' (p.3). These experiences are, she contends, encapsulated in the form of *presence*, whether in view, or out of view. The experience of emotions, or *emotional presence (EP)*, is a key construct in the transactional process in the perceptual field (Lehman, 2006, p.15).

EP has been explored by a handful of researchers in educational research, specifically in the field of online learning (see Cleveland-Innes & Campbell, 2012; Jiang & Koo, 2020; Kang et al., 2007; Sarsar & Kisla, 2016; Stenbom, Hrastinski, & Cleveland-Innes, 2016). One of the most cited empirical studies on EP, to date, is from Cleveland-

Innes and Campbell (2012) in which they investigated the existence of EP in an OLE and integrated this construct into the CoI framework. However, studies on EP in education are still sparse. A search on articles with 'emotional presence' as a keyword in the university library database and Google scholar database returned only seven research articles about EP in education. Among them, five were empirical studies (i.e. Cleveland-Innes & Campbell, 2012; Jiang & Koo, 2020; Kang et al., 2007; Sarsar & Kisla, 2016; and Stenbom, Hrastinski, & Cleveland-Innes, 2016) and two were perspective pieces (i.e. Majeski et al., 2018 and Williams, 2017). In the following section, the definitions, concepts, instruments, and empirical findings of the above articles are reviewed.

Concepts and Definitions of EP

Several concepts and definitions of EP were found from the past literature. Table 1 shows the definitions of EP and the context of the studies (OLE across all studies). Across five studies, there were mainly three different definitions of EP. Most of the studies adopted the Cleveland-Innes and Campbell (2012)'s definition of EP which conceptualized EP as the *outward expression of emotion*, which was less broad as compared to the one by Kang et al. (2007). Majeski et al. (2018) expressed a similar notion that EP seemed to go beyond emotional expression. Moreover, Cleveland-Innes and Campbell gave no clear explanation of the differences between emotion, affect, and feelings in the definition. Kang et al. (2007), however, included 'perceived emotional state' and 'emotional management' as being a part of EP, which was based the EP on Salovey and Mayer (1990)'s concept of emotional intelligence. Similarly, Majeski et al. (2008), viewed EP as emotional intelligence, consisting emotional perception, emotional facilitation, emotional understanding, and emotional management.

Measurement and Instruments of EP

Three reviewed studies worked on the scale development of EP for online learning but, due to the variation in the concept of EP, the dimensional structure of EP varied from one to another.

Table 1

Definitions of Emotional Presence from the Literature

Author and Year	Context	Definition
Kang, Kim, & Park (2007)	OLE	Perceived emotional state, degree of freedom to express emotion, and capability of managing emotion during e-learning
Majeski, Stover, & Valais (2008)	OLE	Emotional intelligence which consists of emotional perception, emotional facilitation, emotional understanding, and emotional management.
Cleveland-Innes & Campbell (2012)	OLE	The outward expression of emotion, affect, and feeling by individuals and among individuals in a community of inquiry, as they relate to and interact with the learning technology, course content, students, and the instructor
Stenbom, Hrastinski, & Cleveland-Innes (2016)	One-to-one online coaching	(*Same as Cleveland-Innes & Campbell, 2012*)
Sarsar & Kisla (2016)	OLE	*(Not reported)*
Williams (2017)	OLE	The ability of feeling the affect of learning content via real time or face-to-face experiences.
Jiang & Koo (2020)	OLE	(*Same as Cleveland-Innes & Campbell, 2012*)

Cleveland-Innes and Campbell (2012) conducted a two-phase study in searching for any evidence of emotional content in OLE on 217 distance education students at a university. First, they conducted text-based analysis of online conference discussion scripts and survey questions of online experience; secondly, they looked at EFA using a modified CoI framework. The results from the two-phase study confirmed the existence of EP in OLE (p.282). Four items out of six measuring EP were clustered into a factor via EFA in the second phase of the study. However, one EP item was clustered into the SP factor, and similarly, one item representing SP was clustered into the EP factor. On reliability adequacy, although this study did not report it, two other studies which adopted this scale did so. Both studies found that it was highly reliable (α = .876 for Jiang & Koo, 2020; and α = .74 for Stenbom, Hrastinski, & Cleveland-Innes, 2016).

Kang et al. (2007) proposed a three-dimensional structure for EP in accordance with the emotional intelligence concept. The three dimensions were *perception*, *expression*, and *management*. With a sample of 418 undergraduate students, EFA was conducted on 16 items which yielded a 13-item three-factor structure of EP. However, reliability analysis of one of the dimensions (i.e. management) was lower than .7 (i.e. .65), a violation of adequate reliability in scale development (Schmitt, 1996). While the items were not explicitly reported in the article, the low reliability value flagged the issue of measurement consistency on EP and scale validity.

As for Sarsar and Kisla (2016)'s measurement, a survey called *Emotional Presence for Online Learning Environment* was developed to assist online instructors in understanding the emotional transfer of online learners. Survey items were drafted from literature review on emotional transfer strategies and went through a process of expert review. Final survey items were distributed to 229 participants, and the collected data was statistically analyzed using EFA and CFA. The analysis yielded 21 items with two factors,

receiving emotions and *giving emotions*. Regarding reliability, the survey had Cronbach alpha value at 0.88.

Other Studies on EP

Besides the studies that work on scale development of EP, one recent study (i.e. Jiang & Koo, 2020) explored EP and other variables among 45 non-traditional online learners. Quantitative results showed that EP was a significant predictor of learners' online learning satisfaction. Additionally, learners' ratings of EP were found to be significantly lower than other CoI presences like TP, SP, and CP. Participants' experience with dichotomous emotions was cited as a possible reason for the dispersion of ratings for EP. Qualitative analysis found the existence of the three dimensions of EP: *activity emotion*, *outcome emotion*, and *directed effectiveness*, as suggested by Stenbom, Hrastinski, and Cleveland-Innes (2016). In addition, the study also found no gender difference on EP, and no correlation between age and EP.

EP has also been explored in one-to-one coaching relationship of inquiry in OLE, with research mainly conducted by Stefan Stenbom and colleagues (e.g., Stenbom, Jansson, & Hulkko, 2016; Stenbom, Hrastinski, & Cleveland-Innes, 2016). His research revolves around how a relationship of inquiry, which engages in purposeful discourse and collaborative learning, could support the development of one-to-one online coaching. By using transcript coding, the research concluded that EP and the existing three CoI presences presented a good structure for the analysis of a relationship of inquiry in online coaching (Stenbom, Hrastinski, & Cleveland-Innes, 2016). Three dimensions of EP functionalities as mentioned in the above study were derived from preliminary transcript analysis and survey scrutiny (p.6). The dimensions were based on studies into personal emotions in OLE and the control-value theory.

Theoretical Base of Emotional Presence

Theories of Emotion

Early systematic theories of emotion were developed in the late 19th century and generally, there are three broad ideas concerning the theories of emotions: emotions are *feelings*; emotions are *motivations*; and emotions are *evaluations* (Scarantino, 2016). Among the most popular theories of emotion mentioned in the respective category above were the James-Lange theory (James, 1884), Dewey's impulsivist approach (Dewey, 1895), and the Cognitive-Motivational-Relational theory (Lazarus, 1966). Both feeling theory and motivational theory received criticism from psychologists due to the challenge in differentiating two emotions through behavior or action tendencies (Scarantino, 2016). For instance, regret is an emotion that is not reflected through actions.

The inadequacy of the above theories then led to the rise of the evaluative theory of emotion. One of the most influential evaluative theories of emotions is that of Richard Lazarus' theory (Lazarus, 1966) and the subsequent revisions (Lazarus, 1991b), known as the CMRT. This research proposes the CMRT to be the fundamental theory of EP as it echoes the same concept of EP used in this study, which views the occurrence of emotions as a *process* which involves the internal and external experiences between a person and the environment.

Cognitive-Motivational-Relational Theory of Emotion

Most of the early theories view emotion as a person reacting to a stimulus or environment. As in the CMRT, it envisions emotion more than the passive reaction of a person to the environment, but also considers how a person selects the environment based on its positive or negative significance to his or her well-being (Lazarus, 1991a).

Key Concepts and their Relationships. The CMRT explains three important concepts about the process of occurrence of emotions, which are *cognitive, motivational*

and *relational*. Lazarus considers emotion to occur from one's cognitive appraisal based on the ongoing transactions with the world. *Cognitive* appraisal of emotion is unique and relative to the person and the environment. A person evaluates the personal significance of the stimuli with the environment based on a person's knowledge and beliefs. *Relational* refers to the occurrence of emotions in a person-environment relationship: the intrapersonal sphere within the person is constantly appraising the interpersonal sphere of the environment. *Motivational* refers to the emotions being the reactions of personal motivation (goals, beliefs, and values) that could be influenced by societal and cultural values, and it varies from person to person, or from group to group, occasion to occasion, and time to time. Hence, the same encounter may result in different outcomes of emotion for two different persons. A person's imagined, anticipated, or actual encounter with the environment determines the quality and intensity of an emotion.

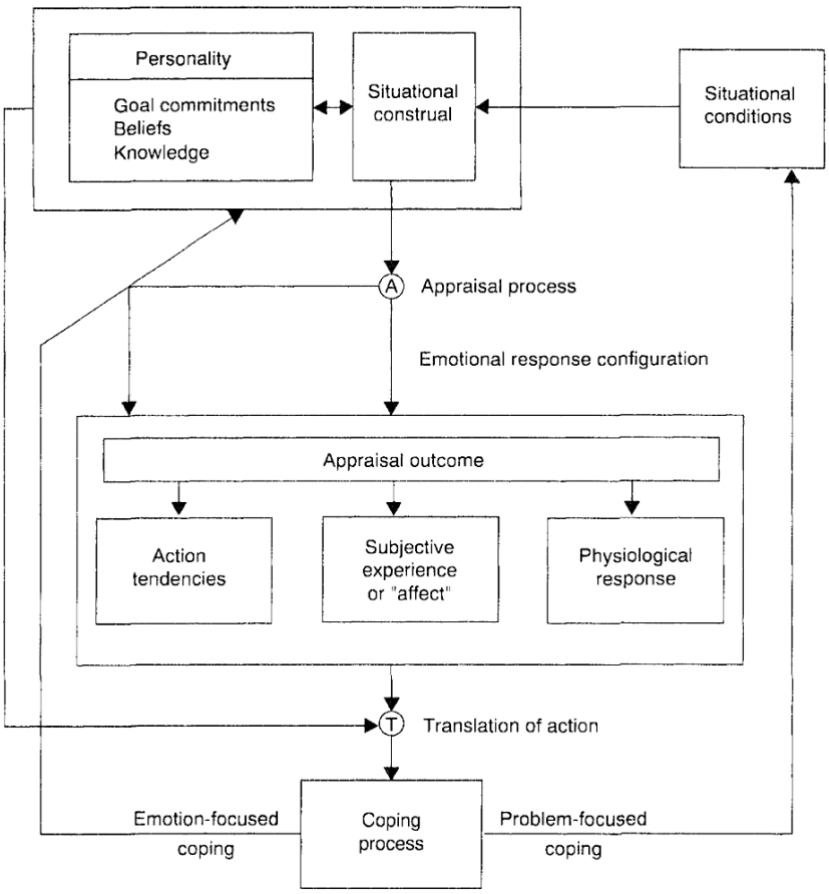
In this theory, Lazarus emphasized the power of cognitive appraisal to shape the reaction of emotion, and conversely, that emotion has the power to disrupt the cognitive processes of the subsequent reappraisals. He illustrated the experience of emotion as a multidimensional system consisting of causal antecedents, and mediating processes (see Figure 2).

Personality factors such as needs, commitment, and goals interact with stimulus of the environment. Hence, such interaction leads to situational construal which results in cognitive appraisals. Cognitive appraisals lead to the experience of emotional responses, including action tendencies, subjective experience or affect, or physiological response. The emotional response will further exert influences on secondary appraisal of action tendencies, such action tendencies are translated into coping processes, either emotional-focused or problem-focused.

At the transaction phase, personality factors such as beliefs, needs, commitments, attitudes, and goals are also interacting with the coping processes simultaneously. The coping activities are reappraised again through the same process which further influences the emotional response state. Cognitive appraisal functions as the center of the construct, and determines if an emotion will occur, the type of emotion and its intensity (Lazarus, 1991a). He suggested that appraisal is immediate and unconscious, simultaneously mediating between stimuli and emotional response.

Figure 2

Model of the Cognitive-Motivational-Emotive System



*Note*s. Source: "Chapter 5: Issues of causality." of Lazarus, R. S. (1991a). *Emotion and adaptation.* New York, NY: Oxford University Press.

Literature Gap

The literature review above helped to identify the depth and breadth of research undertaken to date in relation to EP. Unfortunately, the research into EP is far from sufficient and more research needs to be conducted. This section outlines the knowledge gap with relation to EP in inquiry learning (and the CoI framework in particular) and methodological gap concerning the development of EP instruments.

Literature Gap in Inquiry Learning and the CoI Framework

While previous studies have revealed the effects of different types of inquiry learning on learning outcomes, performance, and academic achievement (e.g., Chu et al., 2011; Mäkitalo-Siegl et al., 2011, Mulyana et al., 2018), they have not addressed the importance of epistemic emotions in inquiry learning.

Despite Dewey's theory of inquiry being the foundation for most inquiry research and which emphasized the importance of emotion in inquiry learning, there have been few empirical investigations into this area. In his book *How We Think,* he explained that inquiry learning is the 'link between interest and deep learning' and further suggested that curiosity is the 'most vital and significant factor' for an inquired mind (Dewey, 1933). In addition, Lipman (2003) reiterated that emotions play an important role in thinking, bringing 'refinements to our sensory discriminations' (p.129). Inquiry learning that leads to deep thoughts are results of knowledge that is of great value to us. Thinking in values (Lipman, 2003, p.130) brings learners to revelation and understanding of new concepts or ideas. Emotions add value to judgment when one connects his feelings to his thinking in a reflective manner. It is therefore important to explore how curiosity, or other epistemic emotions, can promote inquiry learning.

CoI framework provides a conceptual framework to 'define, describe and measure the learning elements of a collaborative and worthwhile educational experience' (Garrison,

Cleveland-Innes, & Fung, 2010, p.6). However, one of the inadequacies of the framework has been the absence of an element assessing the affective domain of educational experience. As highlighted by Cleveland-Innes and Campbell (2012) and Stenbom, Hrastinski, and Cleveland-Innes (2016), consideration of the EP element in the framework was missing. Since past research has shown clear evidence on the ubiquity of emotions in learning, EP should be an important element to be studied in line with the framework. If EP is overlooked in such a prominent framework, it would be challenging to uncover the complexity and dynamism of the learning process that forms learners' educational experience.

Literature Gap in the Concepts and Definitions of EP

Previous studies on EP have contributed to confirming EP as a critical element of the learning process. However, a clear theoretical base of EP has, until now, been lacking. As aforementioned, EP has been defined differently among several authors in the past, and in addition, conceptual redundancy is yet another issue where EP was conceptualized as emotional intelligence in two of the studies. To address these issues, the current study has taken the following stand on the conceptualization and definition of EP.

(i) EP should be grounded on a strong theoretical basis of emotion;

(ii) EP should not be limited to the 'outward expression of emotion'. EP should encompass the intrapersonal experience of emotions within oneself, as well as the outward expression of emotion;

(iii) EP does not only exist in the virtual space of learning. As previously mentioned, the concept of presence is *not limited* to the virtual world. Whether the experience is in the physical or virtual space, EP involves the transaction of emotional processes between the person (private world) and the environment (shared world).

(iv) EP should cover two main areas: (1) the epistemic related emotive experiences for knowledge generation and construction, and (2) the social aspect of learning. These two areas are parallel with the main purpose of a CoI, where collaborative knowledge building for epistemic engagement among learners is central (Shea & Bidjerano, 2009).

Literature Gap in the Measurement and Instruments of EP

The review on EP measurements from the above studies revealed the lack of a reliable and validated tool to assess EP. First, the concept of EP determines the survey items developed. Studies that conceptualized EP as emotions which were outwardly expressed by oneself or others (such as giving emotions, receiving emotions, or expressions of emotions) obtained the factor structure accordingly. However, these items were probably useful within the concept and context similar to those in the studies. They would pose a problem if they were to be used to assess the inner experience of emotions such as regulation processes of emotions. Thus, the measurement of EP is very limiting.

Second, psychometric properties are an important part of scale development. Regarding these issues, several studies did not (i) report on the reliability value of the scale/factor (such as Cleveland-Innes & Campbell, 2012), (ii) report on construct validity analysis (all of the studies); or (iii) reported yet did not meet an adequate reliability value (as in Kang et al., 2007).

In summary, there is an immediate need to develop a reliable and validated measurement of EP that is grounded on a strong theoretical base. The researcher addressed the above issues by taking necessary steps in developing a scale called *Emotional Presence Scale* (EPS), in Study One (Chapter 3).

Literature Gap in Other Empirical Findings on EP

Many of the studies conducted on EP were operationalized using the CoI framework (e.g., Cleveland-Innes & Campbell, 2012; Jiang & Koo, 2020; Stenbom, Hrastinski, & Cleveland-Innes, 2016). However, no previous studies have been found that investigated the nature of EP itself. As EP is a new construct, initial studies should explore the concept of EP in the area of dynamicity, parallel with the concept of the CoI framework. In accordance with the CMRT of emotion, experience of emotion is dynamic due to the ongoing adaptation process occurring between the person and the environment (Lazarus, 1991a). Understanding the dynamic nature of EP in inquiry learning will, it is hoped, reveal how a learner adapts to the stimulus of the learning environment. In addition, past studies have also demonstrated the dynamic nature of TP, SP, and CP. It is therefore rational to first explore this area. This research examined the concept of EP's dynamic nature in Study Two (Chapter 4).

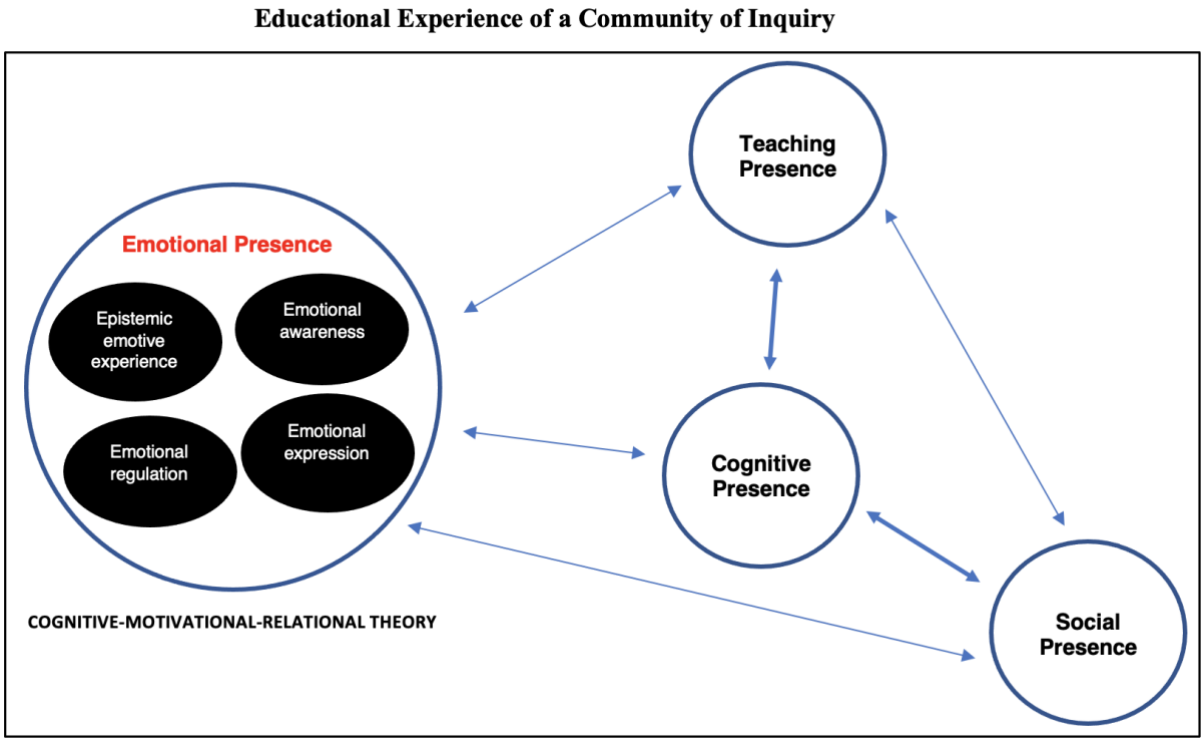
Moreover, no studies have been found exploring the dynamic interplay between EP and the CoI presences. Exploring the relationships among these presences is important in understanding how a successful and optimal educational experience in the CoI could be developed. The current research aims at addressing this gap by exploring the relationships between EP and the three CoI presences in Study Three (Chapter 5).

Conceptual Framework of the Study

Building on the CMRT of emotion and the CoI framework, the conceptual framework of the study was developed and presented in Figure 3. Correlational results of the three CoI presences from the study of Archibald (2010) is portrayed in the framework in Figure 3. This study being chosen because of its context, in an online discussion, was the closest to that of Study Three in this research.

Figure 3

Initial Theoretical Model of the Proposed CoI Framework



Notes. Bold double arrow represents correlation value $r > 0.7$.

EP as a Fundamental Element of the CoI Framework

This research incorporates EP into the CoI framework and explores its underlying dimensions, concept, and interrelationships among other CoI presences. The researcher's proposal is that EP should show a certain degree of correlational relationships with TP, SP, and CP, and in particular it might show a strong relationship with CP. This idea is supported by the assumption of Pekrun (2006)'s control-value theory that emotion and learning have reciprocal causation effects on each other. Investigation into these areas will, it is hoped, disclose the role of EP in the CoI, as well as factors that influence the formation of the presences.

The concept of EP, which is grounded in the CMRT of emotion, blends in suitably with the concept of the CoI framework. Under the CMRT of emotion, EP is shown to be a *process* that is *dynamic,* which is consistent with the nature of the CoI framework being a process model and a dynamic model. Moreover, EP is theoretically connected to inquiry learning which is parallel to the concept of the CoI framework which is itself grounded on the same theory of inquiry. What's more, the CMRT of emotion that describes the experience of emotions encompassing the intrapersonal and interpersonal domains in a person-environmental relationship (Lazarus, 1991a) appears to be systematically aligned with the CoI framework which describes learning as involving the 'personal world and shared world' of a learning community (Garrison et al., 2000, p.92).

EP as a Four-Dimensional Construct

The CMRT views the occurrence of emotions as a dynamic process which encompasses three main areas: the cognitive appraisal, the emotive experience, and the coping (or regulation) of emotions. Within these three areas, the researcher identified four important dimensions related to the experience of emotions in a *learner-learning environmental relationship*. These four dimensions are (i) epistemic emotive experience, (ii) emotional awareness, (iii) emotional expression, and (iv) emotional regulation.

(i) *epistemic emotive experience* refers to a learner's experience of epistemic emotions (such as interest, curiosity, and confusion) during the process of knowledge exploration and generation. In accordance with the CoI framework, one of the main purposes of a CoI is to foster epistemic engagement through online discourse or discussions (Shea & Bidjerano, 2009) and hence, epistemic emotive experience is proposed to be an important area of EP in influencing learning and performance. Epistemic emotions were found to have positive effects on knowledge exploration and generation (Vogl et al., 2019): for example, curiosity was found to promote exploratory behavior

(Litman et al., 2005) and learning (Kang et al., 2009). Confusion, too, was seen as beneficial to learning (D'Mello et al., 2014). Interest, is seen as an emotion that occurs more during the process of learning (i.e., experienced-defined emotion), and much less of a goal-defined emotion (Sansone et al., 2012). This study focuses on two positive (interest and curiosity) and two negative (confusion and anxiety) emotions predicted to promote learning.

(ii) *emotional awareness* is defined as the ability to identify and describe one's own and others' emotional experiences (Agnoli et al., 2019). This falls under the cognitive appraisal area of the CMRT of emotion. Most of the past studies view emotional awareness as a constituent of a larger construct, which is *emotional intelligence*. Additionally, emotional awareness is a part of *self-awareness* and *social awareness* under the CASEL's framework (Collaborative for Academic, Social, and Emotional Learning, n.d.). Past work has shown that emotional awareness can influence evaluative judgments (Gasper & Clore, 2000, 2002). Downey (2003) conducted a survey among 119 undergraduate college students and found that students' emotional awareness had an influence on their evaluation on collegiate satisfaction ratings. Moreover, higher emotional awareness was associated with better interpersonal relationships (Hsieh et al., 2014).

(iii) *emotional expression* refers to the construal of situation and environment allowing one to express thoughts and feelings in the process of learning with the community. This is also a part of the cognitive appraisal area of the CMRT of emotion. Past work reveals that the emotional expression to be influenced by self-presentation and interactional goals (Hayes & Metts, 2008). Studies have also found that various cultural, relational, and social factors influenced the expression of emotion (Planalp & Fitness, 1999); for instance, the presence and expressiveness of others in a particular social setting (Buck et al., 1992; Fischer, Manstead, Zaalberg, 2003), and work demand within the

culture of the company and society (Zapf, Seifert, Schmutte, Mertini, & Holz, 2001) could influence the expression of emotions of the employee. Conversely, the decision to express (or suppress) one's emotions could be goal directed and strategic to elicit desired responses from others (Planalp et al., 2018). In view of the academic setting of the current study, learners' self-image, learning goals, and the learning environment's culture will most likely influence emotional expression.

(iv) *emotional regulation* involves both positive or negative emotional regulation strategies to sustain or cope with the learning activity. Emotional regulation process is seen to play the mediating role between emotions experienced in academic settings and approaches to learning (Rentzios et al., 2019). Moreover, the regulation of positive epistemic emotion was found to enhance motivational level for goal attainment (Sansone et al., 2012). Regulation of emotions has also found to be associated with self-regulated learning (Alonso-Tapia et al., 2020). According to the CMRT, there are two main strategies in emotional regulation, either *problem-focused* or *emotion-focused* (Lazarus, 1991b). Problem-focused strategy refers to the rethinking resulting in a new plan to solve the problem and eliminate the negative emotive experience. Emotion-focused strategy refers to reducing the negative effects of emotions when the stressor is beyond one's control. This study proposes that this area is an important part of EP as effective emotional regulation can enhance both learning regulation and performance.

Research Questions

Considering the knowledge gaps discussed above, this research seeks to investigate the following questions:

1. What are the underlying dimensions of EP in the higher education context?
2. How does EP change over time and correlate with CP and task outcomes of an inquiry learning activity?

3. What is the dynamic interplay between EP and other learning constructs in an inquiry- based online discussion?

Structure of the Study

To investigate the three research questions listed above, the following three studies were carried out to explore EP in the inquiry learning process situated in a community of learners in higher education settings. The three studies in this research were conducted with university students in Japan.

Study One is a scale development study aimed at exploring the underlying dimensions of EP through developing a reliable and validated instrument called EPS. It addresses the issue of varying concepts of EP through exploring the underlying dimensions of EP based on the CMRT of emotion.

Study Two is a quantitative study examining the change of EP and its relationship with learning process and task outcomes. The investigation focused on the change of individual EP level at the beginning and at the end of an inquiry learning activity of a university course. Subsequently, the relationships between the change of EP with learning process represented by CP, and task outcomes were investigated.

Study Three is a quantitative study that explores the interrelationships between EP and three CoI presences (TP, SP, and CP) in an OLE. It accommodated the suggestions of the insufficiency of the current CoI framework by examining how EP interacts with the three CoI presences in an inquiry-based online discussion among a group of university students.

Having integrated the key findings of these studies, a revised theoretical model of the CoI framework that explains the dynamic interplay between four presences is proposed.

Chapter 3: Development and Validation of Emotional Presence Scale (Study One)

Chapter 3 introduces the objectives of Study One and the research question it seeks to investigate. It further explains the methodology of data collection, the findings of data analyses and discussion of the results. The main contribution of the Study One is to develop and validate an instrument with which to measure EP, which is named Emotional Presence Scale (EPS). This study ascertained the underlying dimensions of EP.

Purpose and Question

The purpose of the Study One was to develop a reliable and validated psychometric scale called the 'Emotional Presence Scale' (EPS) in the context of higher education. The conceptualization of EP and the propositions of the dimensions are drawn from within Lazarus' CMRT of emotion and a review of related literature.

Over time various scales have been developed to measure emotions related to various aspects of learning, such as the Classroom Emotions Scale (CES) (Titsworth et al., 2010), Achievement Emotions Questionnaire (AEQ) (Pekrun et al., 2011), and Emotion and Motivation Self-regulation Questionnaire (EMSQ) (Alonso-Tapia et al., 2014). These scales were developed specifically for the measurement of emotions or emotion-related constructs in a specific context or domain and were therefore found not suitable for the scope and purpose of this study. The CES, for instance, was developed to measure emotions related to classroom communication and the AEQ for emotions experienced during academic achievement situations.

As previously mentioned in Chapter 2, there are three main studies that have worked on EP scale development: Cleveland-Innes and Campbell (2012); Kang et al., 2007); Sarsar and Kisla (2016). However, the theoretical basis and conceptual definitions of EP vary widely; and issues related to psychometric evidence of these instruments were found. This has led to the theoretical and evidential basis for the EP measurement not

being firmly established. This study, recognising the need to develop and validate a new and more adequate EP scale, addressed Research Question 1: *What are the underlying dimensions of EP in the higher education context?* It is hypothesized that EP is a four-dimensional construct consisting of epistemic emotive experience, emotional awareness, emotional expression, and emotional regulation, established on the CMRT of emotion.

Methodology

Participants

Participants consisted of students from various public and private universities in Japan: of a total 365 participants, four responses were found to be incomplete and eliminated. The participants were predominantly Japanese (85.8%, *n*=307), age 18-25 (92.8%, *n*= 335), and undergraduates (87.7%, *n*=316). The proportion of male to female participants was almost equal, with males at 49.0% and females at 50.1%. See Table 2 for the demographic details.

Instruments

Emotional Presence Scale

The EPS was situated within Lazarus' CMRT of emotion, which describes emotions as a process of three autonomous phases: cognitive appraisal, emotive experience and emotional regulation (Lazarus, 1991a). Furthermore, as aforementioned in Chapter 2, EPS scale aims to focus on the experience of emotion across two areas: (1) epistemic related emotive experiences, which are emotions related to knowledge generation and construction (e.g., Vogl et al., 2019), and (2) the social aspect of learning. These two areas are the fundamental elements of learning within a CoI, where pursuit of knowledge construction for epistemic engagement through discussion among a learning community is the main purpose (Shea & Bidjerano, 2009).

Table 2

Demographic Profile of Survey Participants

		n	%
Gender			
	Male	177	49.0
	Female	181	50.1
	Others	2	0.6
	Unreported	1	0.3
Level			
	Undergraduates	316	87.5
	Graduates	42	11.6
	Others	3	0.9
Age			
	18-25	335	92.8
	26-35	19	5.3
	36-45	2	0.5
	above 46	5	1.4
Region			
	Kanto	309	85.6
	Hokkaido	31	8.6
	Kyushu	16	4.4
	Chubu	5	1.4

To develop a psychometric scale to measure EP, the researcher conducted a comprehensive literature review, consulted experts' advice on item development and conducted in-depth interviews with university students.

Initial Item Development and Pre-Testing. At the initial phase, 22 items were developed across three dimensions for the purpose of pre-testing the instrument on a batch of 128 university students. Using SPSS, a preliminary analysis, via EFA, was run on these items which generated a three-factor construct for EP. Taking the results together, the researcher personally consulted with three professors of education field and received suggestions to improve the scale. Subsequently, some items were added, reworded, or deleted entirely to improve clarity and content validity. Items reflecting emotions of

interest and curiosity were integrated together as ‘interest-curiosity’ because of the difficulty in distinguishing one from another, as pointed out by previous studies (Ainley, 2019; Alexander, 2019). Moreover, the researcher made the considered assumption that there was no apparent need to distinguish emotions as one single entity if they seemed to appear as a mixed emotion during the learning process. In addition, a glossary of emotions providing the definition of emotions was added. To pursue deeper into EP, the researcher also recruited seven university students for in-depth interviews (see Appendix B for the interview questions). Finally, a 41-item scale was finalized for empirical testing.

Translation. In the second phase, the researcher recruited two bilingual translators to translate the items into Japanese using a back-translation method (See Appendix C for the Japanese version of EPS). The purpose was to administer the instrument to Japanese students who could not understand English but Japanese. The translators ensured that the instrument was both contextually relevant and culturally equivalent in Japan. The translators were recruited based on their status as researchers in the educational field with experience in translating questionnaires in both languages. Discrepancies between the original version and back-translated version were discussed. Adjustments were subsequently made to the Japanese version. Following this, the translated scale was sent to 11 Japanese students to check for possible ambiguities and ease of interpretability, which resulted in no major changes.

Final Item Development for Empirical Testing. A total of 41 items, encompassing four EP dimensions (*epistemic emotive experience; emotional awareness; emotional expression; emotional regulation*), were created to tap perceptions of EP during the learning process situated within a learning community (See Appendix D). These items consist of personality variables and context-situational variables. Emotion appraisal domain consisted of 10 items reflecting *emotional awareness*, as well as *emotional*

expression (Hayes & Metts, 2008; Steins & Book, 2011); emotive experience domain consisted of 16 items reflecting *epistemic emotive experience* (Pekrun, 2019; Schmidt & Rotgans, 2020 for items of interest-curiosity; D'Mello et al., 2014; Lehman et al., 2013 for items of confusion; Griffin & Roy 2019; Hills, 2007; Muis et al., 2015; Rosenfeld, 1978 for items of anxiety; and Pintrich et al., 1991 for hope). One item developed from the findings of interviews was Item 16 (*The course content was somehow related to my past experience*). *Emotional regulation* dimension consisted of 15 items reflecting positive and negative emotional regulation strategies (Abdi et al., 2012; Greenglass et al., 1999; Nelis et al., 2011; Senol-Durak et al., 2011 for items of regulation of negative emotions; Quoidbach et al., 2010; Nelis et al., 2011 for items of regulation of positive emotions). Additionally, results from interviews revealed that students utilized some common strategies to regulate their emotions; among them were *refocusing on planning* and *behavioral display of emotions*. In general, findings from the interviews ran parallel with past literature and no new dimensions were deemed necessary. Participants answered the items using a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The sequence of the items was randomized except for items of *emotional regulation* (Items 27-41) which have the same beginning phrase of the sentences. See Appendix E for EPS in English.

Test Emotion (Hope) Scale

In examining the discriminant validity of EPS, Test Emotion Scale (Hope) (TES-HOPE) component of the AEQ was used to measure the correlational relationship between both constructs (Pekrun et al., 2002). The TES-HOPE measures the perceived level of hope one has towards success in a course test. The present study postulated that the EPS should be only weakly or not at all correlated with the TES-HOPE as both scales measure different constructs. EPS measures the experience of emotions during the learning process, and not one's outlook towards a course test. The scale has eight items in total. A five-point

Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) was used for item response. See Appendix F.

Data Collection

After obtaining approval from the educational institution's Research Ethics Committee to conduct the study (See Appendix G), participants were recruited from various universities across Japan from June to August 2019. The purpose of the survey was explained, and they were informed that participation was voluntary, and that they could quit any time. The responses were collected via hardcopy form and online survey using Google Forms®. Consent of the participants was obtained to use the data collected solely for research purposes. The participants were required to provide their consent before the start of the survey. A total of 365 responses were received: 241 via hardcopy and 124 responses via online survey.

Data Analyses

Data analyses were performed using the IBM Statistical Package for Social Sciences (SPSS) Version 23 and AMOS version 24. The sample was divided randomly into two groups to perform EFA (n = 245) and CFA (n = 116) analyses.

Sample size for EFA was reasonably adequate: this study fulfilled the recommendation of five to ten participants per item by Kass and Tinsley's (1979); and five to twenty participants per item by Costello and Osborne's (2005). The suitability of the data for factor analysis was determined by employing two indices: the Kaiser-Meyer-Olkin (KMO) which measures sampling adequacy (Kaiser, 1974) and should be .60 or higher, and the Barlett's test of sphericity (BS) which measures correlation between items (Barlett, 1950) which should be significant at a probability of .05 or less. To ascertain non-multicollinearity among items, the values of bivariate correlation coefficient of all items should be less than .80 (Field, 2013).

EFA was performed using maximum likelihood (ML) estimation with Promax rotation. ML was used for more generalizable results, in the case of submitting a hypothesized model to a CFA (Haig, 2005; Worthington & Whittaker, 2006). As an assumed correlation between factors existed, Promax rotation, a form of oblique rotation was used. The scree plot was used as the main reference to determine the number of factors to be retained, as the eigenvalue approach has been criticized as unreliable for factor retainment selection (Velicer & Jackson, 1990). Item retainment were decided based on theoretical relevance, communalities value at or above .40 (Carpenter, 2018, p.26), factor item loadings at or above .30 (Russell 2002, Tinsley & Tinsley, 1987), insignificant cross-loadings of less than .40, factor reliability level, a minimum of three salient loadings, and parsimony (p.39).

CFA was performed using ML estimation to assess if the data fit the hypothesized model. The researcher abided by several fit indices recommended by Hu and Bentler (1999) to assess the adequacy of confirmatory analysis: Comparative Fit Index (CFI), Incremental Fit Index (IFI) and Tucker-Lewis Index (TLI) indices to be greater than .95; and root mean square error approximation (RMSEA) index to be less than .06.

For reliability analysis, Cronbach Alpha was calculated to ascertain the internal consistencies of the EPS. For validity analysis, Pearson Correlation Coefficient was calculated between the EPS and TES-HOPE for divergent validity.

Findings

Normality Test

Prior to running EFA on the data, analysis on the normality (skewness and kurtosis) of the data was performed. Items that were skew or kurtic (i.e., standardized *z* value of above the absolute value of 3.29 for $p < .001$, two-tailed test: Tabachnick & Fidell, 2014) were removed. As a result, six items; items 2 and 41were deemed skewed; items 27, 29, 34

and 37 were kurtic, that violated the criteria were removed. The KMO value at .856 was considered ‘meritorious’ (Kaiser, 1974, p.35); while the BS indicator was significant, implying that the sample was suitable for factor analysis (Carpenter, 2018).

Exploratory Factor Analysis

In the initial run of EFA, the minimum value of eigenvalue was set at 1 (Kaiser-Guttman rule). The scree plot of a four-factor solution was observed, consistent with the researcher’s priori of four factor structure based on the theoretical framework. All items fulfilled the bivariate correlation coefficients of less than .80 and communalities value of more than .4. In the four-factor solution, items with weak factor loading or cross loading issues were removed. A total of 16 items were removed in this process (Items 6-14, 16, 21, 23, 28, 32, 33, and 39). This resulted in a four-factor, 19-item solution. For parsimony purposes, as well as the researcher’s discretion on conceptual representation, three further items were removed (Items 4, 15, and 38), resulting in a four-factor, 16-item solution. The final solution was presented in Table 3. The four factors, or subscales, were named: *interest-curiosity, emotional regulation, expression management,* and *emotional awareness.*

Table 3

Factor Loadings of the Items for the Emotional Presence Scale

Items	Factor loadings			
	1	2	3	4
Interest-Curiosity				
1. I was interested in engaging in discussions about the material.	**.799**	-.095	.089	-.045
3. I was curious to search for more information about the new knowledge.	**.776**	.080	-.067	.097
5. I was curious to know beyond what was taught in the class.	**.717**	-.032	.095	-.101
Emotional Regulation				
When I experience negative emotions (eg., anxiety, confusion) in study,				
30. I think about the positive things I could learn from the situation.	-.133	**.745**	.091	-.051
31. I work out a plan to improve my learning strategies.	-.113	**.738**	.094	.066
35. I look up for more information to clarify my doubts.	-.024	**.719**	-.062	-.069
36. I do not think of giving up.	-.039	**.581**	.088	.010
40. When I experience positive emotions (eg., interest, curiosity, hope) in study, I eagerly share with others about what I learnt.	.171	**.340**	-.047	.014
Expression Management				
26. I was able to control the way I expressed my emotions.	-.032	-.023	**.897**	-.059
25. I expressed my emotions in ways that were appropriate to the learning environment.	.049	-.047	**.688**	.096
24. I could manage my negative emotions in this course.	.050	.124	**.596**	-.127
22. I knew the appropriate ways of expressing emotions in this learning environment.	-.049	-.058	**.553**	.316
Emotional Awareness				
18. I was sensitive to the changes of my emotions (eg., interest, confusion, curiosity, anxiety, etc) when studying.	-.088	.002	-.077	**.962**
17. I was aware of my emotions (eg., interest, confusion, curiosity, anxiety, etc) when studying.	.082	-.065	-.019	**.791**
20. I was aware of others' expression of emotions in this course.	.029	.156	.200	**.389**
19. I knew the reasons I felt the way I did.	.143	.036	.085	**.302**

Table 4 presents the descriptive statistics and reliability scores for the subscales. Cronbach's Alpha values estimating the internal consistency of the subscales were of adequate range (i.e., >.70 according to Schmitt, 1996) and yielded internal consistencies equal to .803 for interest-curiosity, .755 for emotional regulation, .786 for expression management, and .741 for emotional awareness.

Table 4

Subscales' Mean, Standard Deviations, and Reliability Scores

EPS Subscales	No. of items	*Mean*	*SD*	Cronbach's Alpha
1. Interest-Curiosity	3	3.06	1.03	.803
2. Emotional Regulation	5	3.21	0.88	.755
3. Expression Management	4	2.83	0.90	.786
4. Emotional Awareness	4	2.83	0.96	.741

Confirmatory Factor Analysis

Based on the EFA results, a first-order model postulating four subscales of EPS was examined: all indices of the fit statistics of the proposed model were within the cutoff values aforementioned ($\chi 2/df = 1.215$, $p = .073$, CFI = .966, IFI = .967, TLI = .958, RMSEA [90% CI] = .039). The analysis did not indicate a need for modification of the proposed model; the results suggest the plausibility of the postulated scales of the EPS according to this model.

Psychometric Properties Evidence

Correlation coefficients reported in Table 5 show statistical relationships among the four subscales, EPS and TES-HOPE: correlations among EPS subscales scores were low to moderate [.345, .463]; correlations of EPS subscales' scores with EPS scores were high [.709, .770]. Conversely, EPS had weak, positive correlations with TES-HOPE (.341). All the subscales were weakly or not correlated to TES-HOPE.

Table 5

Correlation Analyses between Emotional Presence Scale and Test Emotion Scale (Hope)

	1	2	3	4	5	6
1. Interest-Curiosity	1	-	-	-	-	-
2. Emotional Regulation	.345**	1	-	-	-	-
3. Expression Management	.461**	.463**	1	-	-	-
4. Emotional Awareness	.425**	.359**	.394**	1	-	-
5. EPS	.709**	.765**	.770**	.731**	1	-
6. TES-HOPE	.323**	.337**	.338**	-.056	.341**	1

** Correlation is significant at the .01 level (2-tailed).

Discussion

The primary purpose of the Study was to develop and validate the psychometric properties of EPS. EFA analysis from the first sample (*n*=245) indicated that the items cohered into interpretable factors that represented the proposed construct, based on theoretical background. The factor structure was further validated with a second sample (*n*=116) which supported a four-factor model with 16 items. The findings suggested that EP has a multidimensional first-order factor structure with four latent dimensions (*interest-curiosity, emotional regulation, expression management, emotional awareness*). The first-order factor structure of EP is consistent with the assumptions of past studies (e.g., Cleveland-Innes & Campbell, 2012; Kang et al., 2007).

Four Dimensions of EP

After the conduct of EFA, the final version of EPS maintained the same four-dimensional structure as the initial version of EPS. All the items remained in the initial proposed dimension respectively. However, the label of *epistemic emotive experience* and *emotional expression* was changed to *interest-curiosity* and *expression management*, after thoughtful consideration that the new labels were better conceptual representation of the retained items.

Interest-Curiosity

This dimension consists of three items measuring interest-curiosity in knowledge exploration and construction. Three other emotions initially included in the survey items; confusion, anxiety, and hope, did not load onto any of the latent factors, indicating a lack of association with the latent factors. Despite findings from past literature that suggested epistemic emotions, like confusion, could potentially lead to deeper learning (e.g., D'Mello et al., 2014; Vogl et al., 2019), there were found situations where confusion is regarded as unproductive to learning (Lehman et al., 2013, p.86). Similarly, anxiety could lead to task-irrelevant cognitive activities (such as worry) that impede task performance (Eysenck, 1979, p.365). Hope, though was not documented in past literature as an epistemic emotion but rather a sense of expectancy (Feldman & Kubota, 2015), played an important role in sustaining learning amidst difficulties (p.2). The findings of this report, however, showed that neither of the latent factors explain hope, indicating that it could be measuring something other than EP. Nevertheless, interest-curiosity was found to be the most salient emotion for epistemic engagement in learning.

Emotional Regulation

This dimension consists of five items measuring common strategies undertaken to cope, manage or regulate the emotions experienced in the learning process. Four items were related to regulation of negative emotions, also known as coping strategies (Lazarus, 1991a). Of the four items, two strategies were emotion-focused while the other two were problem-focused. Emotion-focused strategies refer to strategies that aim to change the emotional response to the stressor (p.618), such as 'think about the positive things instead'. A student is most likely to use emotion-focused strategies if (s)he has little control over the stressor (p.618). With items related to problem-focused strategies, actions to change the source of stressor were taken, such as help seeking (p.618). Only one item concerning

positive emotional regulation was retained, which was ‘eagerness to share with others what was learned’. This is a positive emotion regulation strategy known as *behavioral display* (Nelis et al., 2011).

Expression Management

This dimension consists of four items measuring the ability to manage the expression of emotions through appraising context and cultural appropriateness. This subscale is particularly new as past studies focused on measuring EP based on the display of emotions through text-based discussion. The researcher argued that measuring only the outward display of emotions provides a limited understanding of a learner’s affective educational experience. Expression of emotions is bounded by emotional display rules, which is contextually and culturally appraised (Buck et al., 1992; Hayes & Metts, 2008), including the learning environment.

Emotional Awareness

This dimension consists of four items measuring the ability to recognize and describe the type of emotions and their changes, as well as identify the reason behind the occurrence; intrapersonally in oneself, and interpersonally in others. This dimension is deemed important in the CoI as emotional awareness is considered crucial in building meaningful and purposeful relationships within the learning community (Goldsworthy, 2000; Hsieh et al., 2014), and was found to be associated with course satisfaction (Downey, 2003), academic achievement (Parker et al., 2004), meta-emotions (feeling about feelings), and emotion regulation (Goldsworthy, 2000; Herwig et al., 2010; Szczygieł et al., 2012).

Employment of EPS

EPS, therefore, is a desirable measurement for measuring the concept of EP in the higher education setting, situated within a learning community. In relation to this, EPS may

not be suitable for the context of learning in isolation, without any form of interaction with other learners in the course. Further study needs to be carried out in this area to prove this assumption. The researcher assumed that EPS would be especially useful for higher education settings, where critical inquiry of academic discourse and discussion is an important element within a learning community, as indicated in Garrison, Cleveland-Innes and Fung (2000), and Weaver and Tuten (2014). It is proposed that EPS is a measurement suitable for epistemic related activity or setting, such as a single course (course-specific), a single lesson (lesson-specific), or a single task (task-specific). Furthermore, the researcher has proposed that EP can be a fundamental element of the CoI framework (refer to Study 2 in Chapter 5), and in this regard, EPS will become an important operational tool of measurement in a CoI.

Chapter 4: Change of Emotional Presence and its Association with Knowledge Acquisition and Task Outcomes (Study Two)

Chapter 4 introduces the objectives of Study Two and the research question it seeks to investigate. It further explains the methodology of data collection, findings of data analyses and discussion of the results. The primary contribution of Study Two is to investigate the change of EP within an inquiry learning activity and discover its relationship, if any, with knowledge acquisition and task outcomes. Throughout this study, association between the change of EP with learning process (i.e., knowledge acquisition) and task outcomes, as well as the factors that bring about such changes are explored.

Purpose and Questions

The purpose of Study Two was to investigate the dynamic nature of EP, its influences on and significance to learning processes and outcomes in an inquiry learning activity. In this study, the researcher proceeded on the premise that EP is dynamic and can change over time, parallel with the CMRT of emotion that asserts the constant and continuous adaptation of the person-environment relationships over an encounter brings about the dynamic fluidity of emotion (Lazarus, 1991a, p.615). 'Encounter' refers to the inquiry learning activity; while 'person-environment' refers to the *learner-learning environment* which encompasses the learning community (such as teachers and peers), classroom culture, along with others. Consistent with previous studies (e.g., Archibald, 2010), CP was measured as a learning construct related to perceived knowledge acquisition, a crucial element in the learning process. It was hypothesized that; EP is dynamic in nature and the change of EP correlates with knowledge acquisition and task outcomes of an inquiry learning activity. EP was expected to increase in the learning process and the change was expected to have effects on one's CP level and task ratings of the activity. To achieve the research purpose, Study Two addressed Research Question 2:

How does EP change over time and correlate with CP and task outcomes of an inquiry learning activity?, with the following sub-questions:

2.1 How does EP change at the beginning and at the end of the inquiry learning activity?

2.2 What, if any, is the relationship, between the change of EP with knowledge acquisition (CP) and task outcomes?

2.3 How do students perceive EP and its changes in the inquiry learning activity?

Methodology

Study Two is quantitative research conducted within an undergraduate-level course in a small private university located in Tokyo, Japan between October 2019 and November 2019. The study involved data collection of a convenience sample from a three-week microteaching activity conducted during the course using four sources: survey, observation notes, emotion record sheets, and focus group interviews.

Context

The Educational Institution

A distinguished, private university in Tokyo, Japan that provides courses in both Japanese and English was selected because the inquiry learning approach is commonly adopted in the teaching and learning of some courses, which provides a suitable context for the conduct of this study.

The Course Details

The blended course entitled "EDU203 Instructional Design (ID) and Technology" aimed to develop understanding of ID and motivational design and theories; psychological and pedagogical background of learning; and applying ID and motivational models in developing, implementing, and evaluating a lesson plan. The course was conducted for a span of 11 weeks in the Autumn term of 2019 (from September 2019 to November

2019). Major learning activities of this course included weekly online and offline discussions, two microteaching activities, one asynchronous intercultural online discussion, and a quiz. Study Two was conducted in conjunction with the second microteaching activity. This meant that prior to this study, all students had participated in a microteaching activity approximately one month before. Therefore, none had zero experience in microteaching in Study Two.

An Inquiry Learning Activity: Microteaching

A microteaching activity was chosen as the context of Study Two because it was an inquiry learning activity involving several stages (Arsal, 2015, p.143); specifically stages of planning and exploration, development, implementation, and evaluation. These stages and their concomitant demands posed a natural experimental setting where emotions experienced by each student may, to some degree be similar, or indeed different in some respects. Furthermore, the microteaching activity allowed for knowledge acquisition, integration, exploration, and inquiry of existing and new knowledge (de Lange & Nerland, 2018; Fernandez, 2010), which was anticipated to invoke epistemic-related emotions along the process. Students involved were to integrate and apply their knowledge of ID models into their lesson planning (pedagogical related) and explore the new topic in designing the content (content related), with the integration of technology (technology related). In this way, the microteaching activity provided a more than suitable context for Study Two to investigate the change of EP as the encounter unfolded.

The microteaching activity required each student to be randomly assigned to a group of three or four students forming a total of 16 groups; each group was tasked to develop a lesson plan on a given topic (i.e., blended learning or gamification), using an ID model they had learnt previously in the course. These were never-taught-before topics in this course and were expected to be new to the students. In week 7, the students met with

their group members for the first time in class and kick-started the planning for the activity. They were to collaboratively develop a lesson plan and teaching material, each graded tasks. In the final week, each group was to teach a lesson to another peer group and evaluate their microteaching session through the use of recorded video. Finally, each student was to write an individual reflection note regarding their microteaching experience. In total, the microteaching activity spanned a period of three weeks (from October 17 to November 7 of 2019).

Participants

The participants were recruited from the course to participate in this study, with the instructor's permission, through an in-class announcement. Participation was on a voluntary basis, and each received a small token of appreciation as compensation. Respondents totaled 33 students, predominantly female (69.7%, *n* = 23), juniors (39.4%, *n* =13) and Japanese (87.9%, *n* = 29), with a response rate of 61%.

From a pool of 20 volunteers, representing 11 groups, who responded to the researcher's invitation, the researcher selected 10 participants consisting of four groups: two from Blended Learning groups, and two from Gamification groups to participate in the focus group interviews. Table 6 shows the basic profile of the interviewees.

Table 6

List of Interview Participants of Study Two

No	Response ID	Microteaching Group	Microteaching Topic	Gender	Nationality
1	Student-A	1	Blended Learning	Female	Japanese
2	Student-B	1	Blended Learning	Female	American
3	Student-C	2	Blended Learning	Female	Japanese
4	Student-D	2	Blended Learning	Female	Japanese
5	Student-E	2	Blended Learning	Female	Peruvian
1	Student-F	3	Gamification	Female	Japanese
7	Student-G	3	Gamification	Male	American
8	Student-H	3	Gamification	Male	Japanese
9	Student-I	4	Gamification	Female	Japanese
10	Student-J	4	Gamification	Female	Japanese

Instruments

Five instruments were used in Study Two for the collection of data, namely the EPS, the CP Scale of the CoI Survey, the emotion record sheet, observation notes, and semi-structured focus group interview questions.

The Emotional Presence Scale

The 16-item scale (Appendix H), which was developed and validated in Study One (Chapter 3) was used to measure a student's level of EP. Briefly, it consists of four dimensions: (1) *interest-curiosity* (2) *emotional awareness*; (3) *expression management*; and (4) *emotional regulation*. It employs a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The questions were slightly modified to suit the context of the study. The word 'study' was replaced with 'the microteaching activity'. In addition, demographics data such as age range and gender were included. It holds a Cronbach Alpha of reliability of .861.

The CP Scale of the CoI Survey

The 12-item scale (see Appendix I of 'Cognitive Presence' section) with favorable reliability and construct validity (Arbaugh et al., 2008) was used to measure a student's level of CP. The survey was a part of the CoI survey which consists of measurements of three presences, namely, TP, CP, and SP scales. The phrase 'online discussions' were modified to 'discussions' to suit the context of the study, which was a blended format. The scales of each presence have been used separately in many past studies that measured a specific presence (for e.g., Akyol & Garrison, 2011 on CP; Shea et al., 2006 and Wisneski et al., 2015 on TP; and Swan & Shih, 2005 on SP). It holds a Cronbach Alpha of reliability of 0.95 (Arbaugh et al., 2008). The participants answered with a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Emotion Record Sheet

The one-page, open-ended reflective sheet was used to document the experience of emotions during the three weeks of the microteaching activity (See Appendix J). Each interviewee was required to fill out the sheet before the start of their focus group interview sessions. Each sheet comprised four main sections, in line with stages of microteaching activity, which are *planning*, *exploration*, *development*, and *teaching and evaluation*.

Observation Note

The researcher was also the teaching assistant (TA) for this course during the conducting of this study, and as such assisted the instructor in supervising in-class learning activities and helped in administrative tasks such as attendance and grading. While the researcher remained distant from the students during the microteaching activity, she made observation notes about the microteaching activity from Week 7 to Week 10. The purpose of such observations was to capture the context within which the activity was conducted.

Questions for Focus Group Interviews

A set of questions for in-depth focus group interviews was prepared to explore group participants' overall experience in the microteaching activity, including perceptions on EP, attitudes, thoughts, and feelings. (See Appendix K). The questions covered four areas related to EP: *emotive experience*, *emotional awareness*, *expression management* and *emotion regulation*.

Data Collection

Obtaining Consent and Recruitment of Participants

The approval to conduct the study (See Appendix G), having been granted by the educational institution's Research Ethics Committee, the consent of the course instructor was sought, both to conduct the study in her course and recruit the necessary participants. The purpose of the study was explained and those interested were informed that their participation was voluntary, and that they could withdraw at any time. The responses were collected via hardcopy form and online survey using Google Forms®. Consent of the participants was obtained before the start of the study, through the ticking of 'Yes' or 'No' on the 'Agreement' section of the hardcopy form, or through the ticking of the box 'Yes' or 'No' in the agreement section of the online survey.

EPS and CP Scale. The EPS survey was conducted twice, once in the first week (Time 1) of the microteaching activity, and the second in the third week (Time 2) of the activity. The CP scale, however, was conducted only once, at Time 2. During the first collection, a total of 11 responses were received via hardcopy and 22 responses via online surveys. During the second collection, all the responses were of hardcopy format.

Emotion Record Sheet. Before the start of the focus group interviews, the participants were invited to fill out the emotion record sheet. Participants were asked to reflect on the stages of microteaching and write down their experience of emotions during

each stage. It was an open-ended format, and they were free to write in sentences, phrases, or in single words. On average, each participant completed it within 10 minutes.

Focus Group Interviews. On the last page of the survey, during the second survey administration, the researcher wrote an invitation to students to participate in a focus group interview. Details about the interview, such as the purpose, duration, and reward for participants were explained. The groups which were interested in participating provided their email addresses. The researcher then sent an email to them to arrange a suitable time for an interview.

Focus group interviews were conducted separately with each group in a study room located on the first floor of the university library, meaning a total of four focus group interviews were carried out. Each interview took about 35 minutes on average. The researcher briefed the participants about the procedure before the start of each interview, and they were informed that the interview would be recorded. At the end of the interview, each participant received a token of appreciation. The interviews were transcribed into Word file format and checked twice by the researcher. A copy of the transcript was sent to each group for review and revision if necessary.

Lecture Observation. The researcher observed the microteaching activity from the beginning to the end. Among the events that happened during this activity were group formation, discussion, and planning. The researcher took observation notes to keep track of the details which were later used as reference in understanding of the focus group interviews.

Ratings of Task Outcomes. Task outcomes were measured by assessing the ratings of four tasks attained in the microteaching activity: lesson plan, teaching material, microteaching video, and individual reflection note.

Data Analyses

Prior to conducting data analyses, the researcher performed data checking on possible missing entries on the day of the first survey distribution. Three responses with missing entries were detected. The researcher contacted the participants to ask if they would like to answer the missing items and the participants provided their responses within the first week of the activity.

For the sub-research question 2.1, the researcher employed paired *t*-test analysis to explore the change in EP of each participant between the two-time measurements (Time 1: beginning; Time 2: ending) of the microteaching activity. EP scale was scored by calculating the mean of the ratings of all items. Paired *t*-test was used to compare the EP level of the same participant at the two time points to determine if there was statistical evidence that the EP levels between the paired observations were significantly different from zero. In addition, Cohen's *d* was used to calculate the effect size, which indicates the strength of the relationship between the paired observations (Cohen, 1988).

For the sub-research question 2.2, the researcher conducted bivariate regression analysis to explore the relationships among various learning constructs. Bivariate regression analysis was used to determine the relationships between the change of EP with CP, and task outcomes. There were four types of graded tasks in the microteaching activity: (1) lesson plan, (2) teaching material, (3) microteaching video, and (4) individual reflection note. Tasks (1) to (3) were group tasks, with each task weighing 10%, 5% and 5% respectively. Task (4), which was the only individual task in this activity, had a weightage of 15%. Grading of the tasks was done by the instructor and the TA. The instructor then reviewed again both gradings, discussed any discrepancies, if necessary, before calculating the overall final grades. Inter-rater reliability of both gradings was computed to ensure consistency between the gradings of both raters. Task outcomes were

analyzed in preference to common learning outcomes (such as Bloom's Taxonomy) as doing so can provide information in relation to the change of a process and its immediate end results through investigating the association between the change of EP and direct (task) outcomes.

For the sub-research question 2.3, the researcher employed content analyses of focus group interview transcripts and emotion record sheets to investigate the perception of students on EP change in participating in the microteaching activity. The researcher employed a qualitative analysis software (QDA Miner Lite version 2.0.7) to code the content of the interview transcripts. Specifically, an inductive coding technique, which allows for multiple codes within a unit of meaning, (Miles & Huberman, 1994) was employed. *Units of meaning* here refers to the segment of transcript that formed meaning rather than a single word, phrase, partial or full sentence, or a complete paragraph. The codes were categorized into four main clusters, in accordance with the dimensions of EP: a) emotive experience, b) emotional regulation, c) expression management, and d) emotional awareness.

Findings

Normality Test

A Shapiro-Wilk's test showed that EP (Time 1) and EP (Time 2) were approximately normally distributed, with a skewness of -.665 (SE=.41) for EP (Time 1); and -.237 (SE=.41) for the EP (Time 2). The reliability of EP scale was calculated for both tests. Mean Cronbach's alpha value of both tests was .751. The Shapiro-Wilk's test showed CP scale was normally distributed, with a skewness of -.248 (SE=-.47). The reliability of the CP scale was .840. The Shapiro-Wilk's test for all four task outcomes; lesson plan, teaching material, microteaching video, and individual reflection note, showed significant

results, indicating violation of normality test. Further checks via the Kolmogorov-Smirnov test also returned the same result where the normality test was violated.

Changes of EP over Time

To investigate Research Question 2.1 (*How does EP change at the beginning and at the end of the inquiry learning activity?),* paired *t*-test analysis was performed at the construct and dimensional level. Overall, mean EP level was noted to increase at the end of the microteaching activity compared to at the beginning (see Table 7).

At the construct level, participants' EP level increased significantly at the end of the microteaching activity (M = 3.82, SD=.47) when compared to at the beginning (M =3.66, SD=.34), t (32) = -3.29, p= .002. Calculated Cohen's d value for the change in EP was of medium effect size at .57.

At the dimensional level, all four dimensions showed an increase in mean value at Time 2 compared to at Time 1. Among them, *interest-curiosity*, t (32) = -2.70 (p = .011), and *expression management*, t (32) = -2.78 (p = .009) increased significantly. There was a .24 increase for *interest-curiosity* from Time 1 (M = 3.61, SD =.57) to Time 2 (M = 3.85, SD =.64); and a .27 increase for *expression management* from Time 1 (M =3.59, SD =.64) to Time 2 (M = 3.86, SD =.57). *Emotional regulation* increased from Time 1 (M = 3.76, SD =.44) to Time 2 (M = 3.81, SD =.51) but not significantly, t (32) = -.506 (p = .616). Similarly, *emotional awareness* increased from Time 1 (M = 3.62, SD =.46) to Time 2 (M = 3.80, SD =.60), but not significantly, t (32) = -1.74 (p =.091).

Table 7

Changes of EP and its Four Dimensions over Time (from Time 1 to Time 2) (n=33)

	Time	Mean	SD	*t*	df	*p* (2-tailed)
Emotional Presence	Time 1	3.66	.34			
	Time 2	3.82	.47	-3.29	32	.002**
- Interest-Curiosity	Time 1	3.61	.57			
	Time 2	3.85	.64	-2.70	32	.011*
- Emotional Regulation	Time 1	3.76	.44			
	Time 2	3.81	.54	-.51	32	.616
- Expression Management	Time 1	3.59	.64			
	Time 2	3.86	.57	-2.78	32	.009**
- Emotional Awareness	Time 1	3.62	.46			
	Time 2	3.80	.60	-1.74	32	.091

**Result is significant at .01 level.

*Result is significant at .05 level.

Relationship between Change of EP, CP, and Task Outcomes

To investigate Research Question 2.2 (*What, if any, is the relationship between the change of EP with knowledge acquisition (CP) and task outcomes?),* Spearman's correlation analyses were employed to assess the correlations between and among change of EP, CP, and task outcomes (see Table 9). Spearman's correlation coefficient was used in this case because the distributions of task outcomes were not normally distributed.

First, the analysis of inter-rater reliability of the four task outcomes were presented. As shown in Table 8, the intraclass correlation coefficients of all four tasks were above .900, which was 'excellent' according to the rule of thumb of Cicchetti (1994) and Koo and Li (2016). There were no significant differences between either rater across all four tasks.

Table 8

Inter-rater Reliability Results of the Ratings of Task Outcomes

Task Outcomes	**Intraclass Correlation Coefficient**	*p*
Lesson Plan	1	-
Teaching Material	.937	.000
Microteaching Video	1	-
Reflection Note	.961	.000

Table 9

Mean, Standard Deviation, and Correlations for Change of EP and its Four Dimensions, CP, and Task Outcomes (n=33)

	Mean	*SD*	1	2	3	4	5	6	7	8	9	10
1. Change (EP)	0.2	0.3	1									
2. Change (Interest-Curiosity)	0.2	0.5	.475**	1								
3. Change (Emotional Awareness)	0.2	0.6	.676**	.199	1							
4. Change (Emotional Regulation)	0.04	0.5	.564**	-.034	.126	1						
5. Change (Expression Management)	0.3	0.6	.436*	.195	.004	.121	1					
6. CP	3.9	0.5	.551**	.255	.276	.568**	.115	1				
7. Task Outcome 1 - Lesson Plan (10%)	7.8	0.8	.602**	.164	.341	.624**	.143	.427*	1			
8. Task Outcome 2 - Teaching Material (5%)	4.4	0.3	.182	.363*	.372*	-.035	-.172	.182	.100	1		
9. Task Outcome 3 - Microteaching Video (5%)	4.6	0.6	.060	.143	.143	-.053	.069	.109	-.063	-.055	1	
10. Task Outcome 4 - Individual Reflection Note (15%)	10.2	1.4	.202	.159	.204	-.081	.160	.267	.160	.052	.231	1

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

The findings for relationships between change of EP, CP, and task outcomes, the results can be found in Table 9. At the construct level, change of EP and CP were found to be have a significant and positive relationship (rs = .55, p < .01). Among the four tasks outcomes, change of EP was significantly correlated only with lesson plan (rs = .60,

$p < .01$). At the dimensional level, change of emotional regulation was significantly correlated with lesson plan ($rs = .62$, $p < .01$). As for the remaining task outcomes, change of EP and its respective dimensions were found to have weak to very weak correlations ($rs = .40$ -.37, $p < .05$).

Students' Perceptions of EP

To investigate Research Question 2.3 (*How do students perceive EP and its changes in the inquiry learning activity?*), data collected from the focus group interviews and document analyses of the emotion record sheets from 10 participants were analyzed.

Findings from Focus Group Interviews

The findings of the focus group interviews were presented in four areas: 1) emotive experience, 2) emotional awareness, 3) expression management, and 4) emotional regulation.

Emotive Experience. In general, all participants reported experiencing an array of both positive and negative emotions through different stages of the activity. Such experiences were never constant but continually changing from phase to phase. Overall, the change in participants' interest-curiosity level was the most talked about area. Participants generally experienced a gradual increase of interest-curiosity as they started to explore more information. New knowledge piqued their curiosity and motivated them to go deeper into the topic. Student-J noted '*At first, I was not interested in microteaching. I thought it was really hard to prepare for, and it was 30 minutes long, but it was searching about the topic that made me think it was very interesting, so my low interest gradually increased'.* A similar account was recorded from Student-I, claiming that '*understanding (about the topic) grew my interest*'. Increased level of interest-curiosity became a motivational force in knowledge exploration. However, one participant, Student-A, recalled her distinctive experience as 'fluctuating like a wave'.

Confusion, another epistemic emotion was also discussed during the interview. Generally, participants recalled feeling confused with the use of ID models and understanding the topic's content due to knowledge insufficiency and language barrier. Specifically, Student-B highlighted the use of ARCS (Attention, Relevance, Confidence, Satisfaction) ID model stating that it was confusing because it was a 'loose model' without any clear, specific steps. Another participant, Student-H, admittedly said, '*I was confused because I knew nothing about gamification, so I don't know how to search about it, and also what is the good information, like good source (of information)'*. However, the interviews revealed that the level of confusion started to decrease coming to the final week of the activity, as more and more doubts were clarified along the way.

Another area that saw changes in emotive experience was related to the feelings of stress, nervousness, and anxiety. These feelings of unrest generally peaked at the beginning of the activity due to the many uncertainties: meeting new team members, grappling with newly assigned topics, facing ambiguities over ID model application were among the factors. In addition, teamwork issues added to the negative emotive experience for some groups, among these were the encountering of unmet expectations or failure to meet deadlines. Student-B shared about how being an English native made her the sole reliance of the team, which comprised of generally Japanese natives. This situation indirectly added extra pressure to her.

Emotional Awareness. Interestingly, the awareness level of participants of their experience of emotions varied. Student-A and -B were fully aware throughout the activity, while Student-F and -G were mostly unaware of their positive emotive experience, but only the negative side. They were only made aware in retrospection, particularly when filling out the emotion record sheet. Student-F expressed her recollection in this way '*Negative emotions, I was totally aware of it (laughing….). Oh my God, pretty stressed!*'.

The high level of awareness was due to the fact they were affected by negative experiences to a certain degree, on top of their packed schedules in completing other assignments under tight deadlines. Furthermore, the pressure to 'perform' on the final day of microteaching and be recorded for an evaluation session contributed to their stress level along the way.

Emotional Regulation. Participants adopted several strategies for coping with both positive and negative emotive experiences. For positive emotive experience, participants revealed that *savoring the good experience* was one of the ways in regulating their positive emotions. Student-G and -H took the fun experience of gamification to plan an exciting class in their next practicum, while Student-E shared with others the interesting application of blended learning in the real-world setting.

At the juncture of peaked negative emotions, most participants adopted *refocusing on planning* strategy, where they believed that planning to deal with the issues directly would alleviate the emotions most effectively. There was, however, one participant, Student-G, who recalled using a *self-blame avoidance* strategy to cope with stress, and in doing so made himself felt at peace because the other teammates were to be held equally responsible for the issues.

Most chose to express their thoughts or feelings directly on the team's communication platform (such as Google Docs or Line chat). To reiterate, all the groups collaboratively developed their lesson plans on asynchronous online platforms such as Google Docs, and by doing so were able to view the work and progress of one another along the development phase. In this way, expressing themselves became a negative emotion regulation strategy, where they adopted *behavioral display* strategy to cope with their stress and anxiety.

Expression Management. Participants encountered the need to express their emotions under stressful situations. These were concerning issues of teamwork, such as

meeting task deadlines and expectations. While deciding to express their concerns, they first appraised the group environment and its appropriateness for such expression. Student-J said that while she chose to express herself directly, she was careful with the words she used. In general, group culture and background, alongside individual differences were the factors that determined the level of expression. Student-I said that '*I think who the group members are (is) very important to (be) comfortable to say our opinions, but also culture and experience are also very important for me.'* However, Student-J chose not to express emotional elements within her team, instead putting the team's goal as the priority.

Findings from the Emotion Record Sheet

Emotion record sheets are short notes written by the participants before the start of their respective interview session. The findings were presented according to the four stages of microteaching activity: 1) planning, 2) exploration, 3) development, and 4) teaching and evaluation. Each stage of microteaching, with its concomitant demands, revealed the changing of EP throughout the process.

Emotions at Planning Phase. The planning phase involved first meeting with group members, selecting an ID model and planning the development of a lesson plan and of teaching material. During this phase, emotions of nervousness, anxiety, and excitement were most frequently recorded, other emotions also mentioned in this phase were stress, doubt, relief, and interest-curiosity. Nervousness was linked to meeting new members, and in contrast, relief was related to familiarity with the group members. Overall, participants were nervous but excited to embark on this activity with the new group.

Emotions at Exploration Phase. The exploration phase involved exploring topics of blended learning or gamification, finding useful resources, and setting the lesson scope. During this phase, the most frequently cited emotions were interest-curiosity and confusion. In relation to this, participants recalled being '*confused with the topic*', '*feeling*

curious about the new topic', and '*excited to know more about the topic as it is useful for future career*'. Other emotions mentioned in this phase were feeling neutral, doubtful, stressed, relaxed, hopeful, nervous, and anxious, due to varying emotive experiences.

Emotions at Development Phase. The development phase involved integrating the ID model into the lesson plan, developing the lesson plan along with teaching material. The most recorded emotions were the same as in the exploration phase, which were interest-curiosity and confusion. Participants seemed to struggle with various challenges at this point. Student-H noted '*Developing the material was the hardest part as we had to make intense information easy and understandable*'. On the positive side, the cognitive and moral support from fellow group members gave them a sense of interest, excitement, and hope in completing the lesson plan. Along the way, other emotions mentioned were enjoyment, hopefulness, doubtfulness, stress, and a feeling of being troubled.

Emotions at Teaching and Evaluation Phase. The teaching and evaluation phase involved teaching the lesson to a peer group and vice versa, and then reviewing the recorded microteaching video with another peer group for evaluation. The most highly cited emotions were interest-curiosity and nervousness, followed by excitement, stress, and worry. Participants connected interest-curiosity to the events of observing the creative teaching methods of other groups. As the session ended, many felt relieved and rewarded, though Student-I regretted that their group could have performed better.

Discussion

Study Two was conducted to identify the change of EP in an inquiry learning activity and any relationship with the learning process and task outcomes. In line with the hypothesis, the results revealed that EP changed over time, demonstrating that a CoI is dynamic in the learning process. Such changes were, it transpired, were related to the stages of the inquiry learning activity; a non-static process filled with fluidity. The study

also found that the change of EP was associated with knowledge acquisition and the main task outcome: the lesson plan.

Change of EP during the Inquiry Learning Activity

Quantitative analysis revealed that EP increased over two time periods of the inquiry learning activity; complemented by the findings from the emotion record sheets, which recorded how EP changed from stage to stage as the activity unfolded.

Change of EP as an Adaptation Process to Task Demands and Goals

The findings of the current study support the CMRT of emotion which argues that the change of one's experience of emotion is due to the ongoing process of adaptation in a person-environment relationship through cognitive appraisals of the encounter (Lazarus, 1991b).

In the current study, the change of EP was concomitant to the demands and goals of each phase of the activity. During the initial stage of the microteaching activity (*planning*), learners faced three main concerns: working with new team members, mastery of new knowledge and application of existing knowledge. This stage was seen as a phase of *anticipation,* where negative emotions such as nervousness, and anxiety were commonly experienced (Grupe & Nitschke, 2013) alongside some positive accounts (towards the new 'adventure') such as excitement and interest-curiosity. Stage of uncertainty affects one's perceived efficiency and effectiveness, which contributes to stress related emotions (p.488). In the *planning* and *development* stages, there were recorded moments of confusion with knowledge ambiguities, along with increased interest-curiosity (to gain deeper understanding), all displaying how emotions changed according to the task demands. This stage can be seen as a phase of *knowledge mastery,* where interest-curiosity are salient (Litman, 2008). Concurrently, collaborative issues within the team slowly emerged; emotions of stress, anxiety and nervousness prompted two main responses at this

juncture: a need to express feelings and thoughts on the issues (i.e. *expression management*), or to cope with the situation internally (i.e. *emotion regulation*). The final stage (*teaching* and *evaluation*) saw the event to achieve the activity goal unfold, where learners went through a phase of *knowledge application* (via group collaboration). Participants generally perceived higher levels of EP, indicating that the phases in the learning process had a direct influence on the change of EP.

The current study also revealed that EP change was the ongoing process of adaptation between the learner and the learning environment to fulfil learning (task) demands and personal well-being (such as acquiring teaching skills in a future career) as Folkman and Lazarus (1985) identified. In summation, the change of EP is a product of one's appraisal of the encounter and ongoing efforts to adapt to the learning environment (p.152).

Change of EP and Individual Differences

The findings of this study revealed the influence of individual differences in the experience of emotions, as found in previous studies of Folkman and Lazarus (1985), and Hamann and Canli (2004), for example. In 1985, Folkman and Lazarus conducted a study to identify the change of emotions and coping strategies among undergraduate students who were sitting for mid-term examinations. They found that despite going through the same stressful situation, students experienced emotions differently from each other largely due to individual differences in cognitive appraisal, perceived difficulty, and control of the encounter (p.168). Similarly, in the current study, findings that despite having shared experiences of emotions, each member, within their respective group, reported distinctive variability in their experience, confirming the influence of individual differences in the change of EP.

Individual differences are multifaceted (Thompson & Calkins, 1996), encompassing personal experiences, beliefs, goals, and needs. Three factors that potentially contributed to the formation of EP in the current study are: perceived control over desirable outcomes, perception of others' control, and individual perceived value of the task. This finding can be explained by the control-value theory which states that the subjective control and value of a learning activity and its outcomes determine the instigation of academic emotions (Pekrun, 2006). In an empirical study of fifth graders, Frenzel et al. (2007) found that students' competence belief, perceived value, and perceived importance of their achievement in mathematics influence their experience of emotions. Furthermore, a study by Kunzmann et al. (2002) found that control beliefs are associated with emotional well-being. Simply put, how a person construes the stimulus reveals the matters at stake (Folkman & Lazarus, 1985, p.161). It is interesting to see that those who care most deeply might end up the most affected counterpart in collaborative learning. In the current study, grades of group tasks were the matter at stake to many participants, and due to lack of control over shared work, some were affected by undesirable outcomes.

Relationship Between the Change of EP and Knowledge Acquisition

In the current study, the positive change of EP was found to be correlated with knowledge acquisition measured by CP. Students who had a higher increase of EP also perceived a higher level of knowledge acquisition in the learning activity. Interestingly, the results showed that the increase in *emotional regulation* of EP was significantly related to CP.

Through emotional regulation, one could respond to situational demands either according to short-term or long-term goals (Boekaerts & Pekrun, 2015, p.83). In this study, students who utilized emotional regulation strategies along the course of the activity seemed to have benefited from doing so. In relation to positive emotional regulation,

learners who adopt strategies to 'satiate' their curiosity for new knowledge or counter the state of uncertainty due to knowledge deprivation are better at attaining learning goals (Litman, 2008). This could be the reason why, in this study, those who perceive a higher increase of emotional regulation also perceive higher knowledge acquisition. In relation to negative emotional regulation, the utilization of coping strategies might have positively contributed to task sustainability. Negative emotions could lead to task-irrelevant cognitive activities that affect task sustainability and performance (Eysenck, 1979, p.365). Seibert et al. (2017) found that effective emotional regulation was an integral component to regulate school-related stress which could prevent academic burnout.

This study found that most of the participants utilized *refocusing on planning*, an adaptive problem-focused strategy, to cope with teamwork issues. Although Seibert et al. (2017) found that adaptive strategies were more effective than maladaptive strategies, such as suppression of emotions (p.3), the results of a study by Burić et al. (2016) showed otherwise; it found a positive correlation between emotional suppression (of external signs of emotions) with learning enjoyment and pride. In view of the context where expression of emotions in academic settings is usually regarded as inappropriate (p.145), suppression seems to be a better way of coping with negative emotive experience. This was also revealed to be the case by a few participants who chose to conceal their feelings and disregard 'emotional elements' while putting task completion as the main goal. In the current study, emotional regulation involved 'satiating' one's interest-curiosity for new knowledge and coping with negative emotive experiences.

Regardless of adaptive or maladaptive strategies, effective coping can invoke volitional and learning regulation strategies to maintain learning goals and intentions, without being overridden by obstacles (Boekaerts & Corno, 2005, p.205). In this regard, during this study, students exercised self regulating strategies in task planning and

monitoring in the microteaching activity. According to *Boekaerts' dual processing model* (Boekaerts & Pekrun, 2015), effective emotional regulation is crucial for self-regulated learning. The model further postulates that continuous appraisals of concomitant emotions (i.e. emotional regulation) operates in two simultaneous paths, one is to achieve *learning mastery;* the other, to maintain *well-being.* This process involves the appraisals of learning and coping intention, which is a critical feature of self regulation. In the current study, the increase in emotional regulation likely contributed to improved learning self regulation, which is crucial for knowledge mastery and well-being.

Contrary to expectations, this study did not find any correlation between the change in the dimension of *interest-curiosity* of EP and knowledge acquisition. While there is no compelling theoretical basis for predicting this association, intuitively and logically speaking, the researcher assumed that the increase in interest-curiosity would contribute to higher CP, but the results did not confirm this assumption. While difficult to explain, this result might be related to the fact that increase of interest-curiosity was insufficient in developing higher CP. In other words, a small change does not necessarily reflect a low EP level, and a big change does not reflect a high EP level. While it is desirable to see positive change in EP level, the level of EP itself could be the main factor contributing to the development of CP.

Relationship Between the Change of EP and Task Outcomes

The findings of the current study on the relationship between the change of EP with task outcomes, showed that the change of EP was significantly correlated with only one task outcome: lesson plan rating. A possible explanation may be related to the task design. Pekrun and Stephens (2010) explained that task structure, complexity or demands can influence learners' perceived value and control, thus influencing emotions.

The lesson plan was the integral component of the microteaching activity because the activity itself was conducted based on how the plan was developed. Participants, in general, perceived the lesson plan as an important yet demanding task. Interview findings showed that participants related their experience to the lesson plan 90% of the time compared to other tasks. Whatever students experienced in developing the lesson plan may have a direct impact on their work on it as the lesson plan can be seen as a reflection of the group's overall teamwork collaboration. Correspondingly, lesson plan rating demonstrated the collaborative work quality. Task demand level influences the task's incentive value, leading to different experiences of emotions (Csikszentmihalyi, 2000; Pekrun, Goetz, Daniels, Stupnisky, & Perry, 2010). As with three other tasks, comparatively, may have lower demands and complexity. Teaching materials were used as supporting resources; microteaching video was used for the evaluation stage, while individual reflection note was a final write-up about the ID model and microteaching activity. The work quality of these tasks, however, did not reflect the whole learning process, unlike the lesson plan. This could be the reason for the lack of correlation found between the change of EP with these tasks' outcomes. In short, the change of EP is related to the *main task output*.

At the dimensional level of EP, the change in *emotional regulation* was found to be correlated with lesson plan rating. The microteaching task was an effortful task and therefore required the use of emotional regulation strategies to cope with arising challenges. This experience could potentially elicit emotional experiences, thus enacting emotional regulation.

As for regulation (or satiating) of interest-curiosity, participants recalled using various learning strategies such as self-questioning if the information is convincing and having discussion with peers. This supports Muis and Pekrun's *cognitive incongruity model of epistemic beliefs and emotions* which explains that the regulation of positive

epistemic emotions has positive effects on deep learning strategies, which then influence learning outcomes (Muis et al., 2015). Interview findings analysis revealed that participants used deep learning strategies such as critical thinking, knowledge application in new situations and information evaluation. No record was found on the use of shallow learning strategies such as rote memorization, for example.

Findings from the interviews revealed that teamwork collaboration was a challenge at times and required the utilization of emotional regulation strategies. Most of the participants recalled using *problem-focused strategies* in working out a plan to tackle issues. As previously stated, constructive emotional regulation strategies were considered an effective way to improve self-regulation of learning as postulated by Boekaerts (2011, p.409). It is highly likely that increase of emotion regulation in the current study contributed to improved self-regulation learning and better task output. Other studies, such as those of Gumora and Arsenio (2002); Hill and Craft (2003); and Thompson (1991), have shown emotional regulation seems to be important to academic success, whilst an inability to cope with negative emotive experiences may affect social competency (Eisenberg et al., 1995). In light of this, the deployment of emotional regulation strategies may well have contributed to better social and cooperative behavior among the team members, and consequently, better task output.

Chapter 5: Dynamic Interplay of Emotional Presence and Three Community of Inquiry Presences in an Inquiry-Based Online Discussion (Study Three)

Chapter 5 introduces the objectives of Study Three and the research question it seeks to investigate. It goes on to explain the methodology of data collection together with the findings of data analyses by presenting the quantitative and qualitative results obtained through survey, content analysis, and interview. The main contribution of Study Three is the highlighting of the role of EP and its significance in promoting a positive online CoI, through examining the dynamic interplay among the presences during the learning process. Specifically, it sought an understanding of how the interactions among these learning constructs could foster development of CP. Finally, this chapter discusses the factors contributing to the formation of EP in the learning process.

Purpose and Questions

The purpose of Study Three was to explore the dynamic interplay between EP with the three CoI presences: TP, CP, and SP, by investigating the relationships between the four constructs, including their composition at the dimensional level. Moreover, Study Three examined how the interplay among presences was associated with the development of CP, taking CP as the outcome variable. Past studies have shown that CP was strongly associated with critical thinking (Garrison et al., 2001; Kanuka & Garrison, 2004). In this study, it is hypothesized that EP correlates with all the presences. It is henceforth predicted that there will be differences in the pattern of knowledge construction between discussion groups of high EP and low EP levels. Finally, the role of EP in fostering epistemic engagement of a dynamic CoI in OLE was deduced and a revised CoI framework was developed.

Numerous studies have explored and theorized the three CoI presences (Garrison, Cleveland-Innes, & Fung, 2010; Shea, Hayes, Uzuner-Smith, Gozza-Cohen, Vickers, &

Bidjerano, 2014; Szeto, 2015), but as discussed in Cleveland-Innes and Campbell (2012), what was largely insufficient and is continuing to be explored now, is the investigation of the affective domain of learners' educational experience using the CoI framework. Study Three investigated the affective domain employing the concept of EP. To investigate Research Question 3: *What is the dynamic interplay between EP and other learning constructs in an inquiry-based online discussion?*, the following sub-questions were asked:

3.1 What, if any, are the correlations between EP and three CoI presences, TP, CP, and SP, in an inquiry-based online discussion?

3.1.1 What, if any, are the correlations between EP and three CoI presences at the construct level?

3.1.2 What, if any, are the correlations between EP and three CoI presences at the dimensional level?

3.1.3 What are the presences that predict CP in an inquiry-based online discussion?

3.2 What, if any, are the differences in the pattern of knowledge construction between the lowest and highest EP groups in an inquiry-based online discussion?

3.3 How do students perceive EP in an inquiry-based online discussion?

Methodology

Study Three was a quantitative research conducted in an inquiry-based asynchronous online discussion of a blended course in a small private university in Tokyo, Japan. This study involved data collection of a convenience sample from three sources: survey, online discussion transcripts and semi-structured in-depth interviews and was conducted between December 2019 and March 2020.

Context

The Educational Institution

The same educational institution as in Study Two was chosen for conducting Study Three, but in a different course which consisted of an inquiry learning activity in the form of asynchronous online discussion. The university was selected based on its adoption using online learning management system (LMS), which is Moodle, in teaching and learning for all courses. It provided a suitable environment for Study Three to explore students' learning experience within an inquiry-based online discussions in a blended course setting.

The Course Details

The blended course entitled "Media Translation" aimed to increase the understanding of theories relating to media translation, to engage in comparative analyses of cultural productions in the process of media translation, and to experience media translation through practice.

This course was conducted for a span of nine weeks in Winter 2019 from December 5, 2019 to February 20, 2020. The instructor provided a clear syllabus on the objectives, activity, and grading scheme of the course: not all the assignments or activities were graded, and there was a final submitted report but no final examination for the course. The lectures were held in a large lecture hall, twice a week with 105 minutes of contact hours in each class. In addition, students were expected to access the Moodle to review lecture slides, post online comments, and participate in asynchronous online discussions. The language of instruction for the course was English, with the submitting of assignments in English or Japanese. Reading or activity materials were also in English or Japanese.

Participants

The participants were recruited from the course, MCC237, to participate in this study through an in-class announcement with the instructor's permission. Participation was

on a voluntary basis with a small token of appreciation as compensation. Survey participants totaled 126 students, predominantly male (66.7%, *n*=84), sophomore (50%, *n*=63), and Japanese (90.5%, *n*=114), with a response rate of 74.7%. All fell in the age range of between 18-24.

Among them, nine students were interviewed. Table 10 showed the basic profile of the nine interviewees.

Table 10

List of Interview Participants of Study Three

Response ID	Gender	Nationality
Student-A	F	British
Student-B	F	Japanese
Student-C	F	Russian
Student-D	M	Japanese
Student-E	F	Singaporean
Student-F	F	Japanese
Student-G	F	Japanese
Student-H	M	Japanese
Student-I	F	Japanese

Instruments

Four instruments were employed in Study Three for data collection, namely the EPS, the CoI Survey, the coding scheme for content analysis, and semi-structured interview questions.

The Emotional Presence Scale

The 16-item scale (see Appendix H) which was developed in Study One aims to measure a student's level of EP. It consists of four dimensions: (1) *interest-curiosity*;

(2) *emotional awareness*; (3) *expression management*; and (4) *emotional regulation*. It holds a Cronbach Alpha of reliability of .861. It has a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). To suit the context of this study, minor modifications were done, of which the word 'study' was replaced with 'the online discussion'. Besides, demographics data, such as age range and gender were included.

The Community of Inquiry Survey

The 34-item survey (see Appendix I) with favorable reliability and construct validity (Arbaugh et al., 2008) was used in this study. The survey had been used in many research settings in the past (e.g., Archibald, 2010; Garrison, Cleveland-Innes, & Fung, 2010; Yang et al., 2016). It aims to measure the level of three presences, namely TP, CP, and SP. It holds a Cronbach Alpha of reliability of .84. It has a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Coding Scheme for Content Analysis

In accordance with the suggestions made by Rourke and Anderson (2004), existing protocols of coding schemes were reviewed and modified to suit the context of the study. Coding schemes of CP and SP were adopted from Shea, Hayes, Vickers, Gozza-Cohen, et al. (2010). The coding scheme of TP developed by Anderson et al. (2001) and the revised version by Shea, Hayes, and Vickers (2010) were reviewed and some indicators were combined, or slightly modified, to suit the context of this study. The coding schemes can be found in Appendix L.

Observation Form

The researcher was also the classroom supporter for this course during the period of this study and assisted the instructor in setting up administrative functions on the Moodle and preparing copies of materials used during the lectures. In this role the researcher observed and took notes on every lecture until the online discussion ended. The purpose

was to provide a clearer picture of the events that prepared students for the task. These events were mainly teaching and learning activities leading up to the task. The researcher was a non-participant observer and did not interact with the students in the course.

Questionnaire for In-Depth Interviews

The questionnaire for in-depth interviews was aimed at discovering participants' overall experience in the online discussions, particularly their perspectives on EP. There were four main sections in this questionnaire: *emotive experience*, *emotional awareness*, *expression management* and *emotional regulation* (See Appendix M).

Procedures and Data Collection

Obtaining Permission to Conduct Research from the Educational Institution

Prior to conducting the study, an application to obtain permission from the educational institution's Research Ethics Committee was submitted (See Appendix G), together with a brief research proposal, a copy of each instrument for data collection and consent forms for instructor and students. Approval was granted, after a few minor corrections, by the institution Research Ethics Committee to proceed with the study.

Obtaining the Instructor's Consent

Upon obtaining the approval from the institution, the consent was then sought from the instructor to conduct the study during her course. After permission was obtained communication concerning the study plan continued through email. The instructor also shared the course syllabus and details of some learning activities to be conducted during the course.

Obtaining the Participants' Consent

After the asynchronous online discussions, the researcher was given a 5-minute duration by the instructor to explain to the students the purpose, significance, and ethical conduct of the study. A copy of the participant consent form was attached together with an

explanation of the study. The students were informed that participation was voluntary, and that confidentiality would be guaranteed.

The Inquiry-Based Online Discussion Task

During the course, the students watched two films, *Dial M for Murder* by Alfred Hitchcock and *A Perfect Murder*, by Andrew Davis. The latter, a 1998 American crime-thriller was a remake of *Dial M for Murder* that was originally produced in 1954. They were then tasked to engage in a critical discussion about how Media Translation were portrayed through the two films. These include comparing the changes in the storyline, or in the context between the two eras of the films, as well as how the use of objects, settings, characters etc. reflect media translation. This task was non-collaborative nor graded. Students were then randomly assigned, via Moodle grouping system, to one of 19 online discussion groups, each group averaging 10 individuals. At the end of the task, the students were required to produce an individual graded media translation project.

Lecture Observation

The researcher observed lectures from the first day of the class until the day the task ended. The researcher took observation notes to keep track of the details of ongoing events related to the task, including lecture content, in-class activities, teacher-student interaction, and student-student interaction. The observation notes were later used as reference in understanding the content and interaction of asynchronous online discussions.

Survey Administration

On the day the task ended, a survey was administered to the students for them to recall their experience in online discussions, while still fresh in their minds. The participants returned the survey at the end of the class and received an authorised token of appreciation.

Semi-Structured In-Depth Interviews

On the last page of the survey, there was a written invitation to students to participate in a one-to-one interview, including a request to provide their email addresses, which were used to arrange an interview appointment. Seven interviews were conducted in a study room located in the university library. Two interviews were conducted via phone call using the LINE app. Each interview, on average, took about 25 minutes. The interviewees were briefed about the procedure, including that the interview would be recorded. Each participant received an approved token of appreciation after the interview. The interviews were transcribed into Word file format and checked twice by the researcher. A copy of the transcript was sent, by email, to each interviewee for review, or revision as necessary.

Data Analyses

Procedures

Prior to the data analyses, two responses with missing entries were removed. This resulted in 126 valid responses. Normality test was carried out before analyzing the data.

Using SPSS version 23, and to investigate the sub-research question 3.1, bivariate regression was used to determine the relationships between EP with other presences at the construct and dimensional levels. Multiple regression analysis was employed to understand the effects of EP, TP, and SP on CP.

The sub-research question 3.2 employed both statistical and content analysis to investigate the patterns of knowledge construction between the three lowest and the three highest EP groups. Using statistical analysis, the mean of EP level for each group was tabulated. First, the posts of students who did not give consent to participate were deleted. Next, the content of online discussions was coded according to the revised coding schemes. The same *units of meaning* and *inductive coding technique* as in Study Two were

employed. For this purpose, qualitative analysis software (QDA Miner Lite version 2.0.7) was employed in coding and clustering of the transcript of online discussions. Furthermore, the interaction between the group members in the six discussion groups on Moodle was tracked. Using information such as time and date of posts made available on the Moodle forum, the direction of each discussion and trends emerging from their posts and replies were tracked.

For sub-research question 3.3, the same software (QDA Miner Lite version 2.0.7) was employed in coding interview transcripts. Similarly, the *units of meaning* used in online discussion transcripts, were employed to code the segment of interview transcripts. The codes were sorted into four main clusters according to the dimensions of EP: (1) emotive experience, (2) emotional awareness, (3) expression management, and (4) emotional regulation. Additionally, messages reflecting three CoI presences of TP, SP, or CP, were also coded accordingly.

Validation of Content Analysis

To validate the content analysis of the online discussions, the following protocols were employed. Firstly, the researcher read through the content and associated coded messages. The same process was repeated to avoid misinterpretation of the messages. Meanwhile, to corroborate the analysis, one experienced external coder in content analysis was consulted. Prior to the start of the coding process, he was given a briefing about the coding scheme and three pilot coding sessions, followed by employment of a negotiated coding approach in which any discrepancies of both coded transcripts were actively discussed until a consensus was reached. In this way, ongoing training and refining of the existing coding scheme to suit the context of the study was made possible, and thereby increasing reliability (Garrison et al., 2006).

Findings

Normality Test

A Shapiro-Wilk's test showed that EP, TP, CP, and SP were approximately normally distributed, with a skewness of -0.11 (SE=0.2) for EP; 0.03 (SE=0.2) for TP; -0.06 (SE=0.2) for CP; and -0.20 (SE=0.2) for SP. They had an overall Cronbach's alpha value of .942: EP component had a value of .840; TP component had a value of .916; CP component had a value of .881; and SP component had a value of .791.

Correlations Between EP and Three CoI Presences (TP, CP, and SP)

To investigate Research Question 3.1 (*What, if any, are the correlations between EP and three CoI presences, TP, CP, and SP, in an inquiry-based online discussion?),* various statistical analyses were performed as shown in the following sections.

Correlations between EP with Three CoI Presences at the Construct Level

Pearson correlation analyses were used to assess the correlation among EP, TP, CP and SP (Table 11). EP was positively correlated with all the three CoI presences at the significant level of .001. EP showed the highest correlation with CP, explaining 51% of the variance, indicating that students who perceived higher EP in the online asynchronous discussions also perceived higher CP. This correlation was followed by SP which explained 42% of the variance and 28% of the variance of TP.

Table 11

Mean, Standard Deviation, and Correlations for EP, TP, CP, and SP (n=126)

	M	SD	1	2	3	4
1. EP	3.6	0.5	-			
2. TP	3.9	0.6	.531	-		
3. CP	3.7	0.6	.717	.549	-	
4. SP	3.6	0.6	.649	.349	.619	-

Note: All coefficients are significant at $p < .001$.

Correlations between EP with Three CoI Presences at the Dimensional Level

At the dimensional level, Pearson correlation analyses were used to assess the correlation between the dimensions of EP with TP, CP, and SP (Table 12). All four dimensions of EP were positively correlated with three dimensions of TP ($r = .18$ - $.46$, $p < .01$, or $.001$). All four dimensions of EP had a relatively higher correlation with the four dimensions of CP ($r = .24$ - $.61$, $p < .01$ or $.001$). The four dimensions of EP were also positively correlated with three dimensions of SP ($r = .21$ - $.47$, $p < .05$, $.01$ or $.001$).

Table 12

Mean, Standard Deviation, and Correlations for Dimensions of EP (Interest-Curiosity, Emotional Awareness, Expression Management, Emotion Regulation), TP (Design and Organization, Facilitation, Direct Instruction), CP (Triggering Event, Exploration, Integration, Resolution), and SP (Affective Expression, Open Communication, Group Cohesion) (n=126)

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Interest-Curiosity	3.7	0.8	1													
2. Emotional Awareness	3.5	0.6	.389***	1												
3. Expression Management	3.8	0.6	.288**	.402***	1											
4. Emotional Regulation	3.5	0.7	.393***	.399***	.351***	1										
5. Design and Organization	4.1	0.7	.350***	.179*	.330***	.304**	1									
6. Facilitation	4.0	0.6	.428***	.302**	.377***	.460***	.745***	1								
7. Direct Instruction	3.7	0.8	.277**	.324***	.246**	.267**	.562***	.662***	1							
8. Triggering Event	3.6	0.8	.550***	.240**	.273**	.377***	.291**	.399***	.185*	1						
9. Exploration	3.6	0.7	.559***	.392***	.389***	.612***	.346***	.534***	.247**	.577***	1					
10. Integration	3.8	0.7	.421***	.454***	.380***	.441***	.458***	.484***	.257**	.486***	.678***	1				
11. Resolution	3.5	0.6	.415***	.388***	.405***	.422***	.375***	.529***	.476***	.517***	.576***	.543***	1			
12. Affective Expression	3.5	0.7	.449***	.282**	.210*	.465***	.225*	.368***	.161	.485***	.482***	.315***	.419***	1		
13. Open Communication	3.6	0.9	.381***	.300**	.412***	.418***	.210*	.249**	.159	.409***	.371***	.351***	.358***	.498***	1	
14. Group Cohesion	3.5	0.7	.439***	.389***	.381***	.380***	.218*	.324***	.256**	.329***	.484***	.449***	.483***	.478***	.429***	1

*** Correlation is significant at the .001 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).

Effects of EP, TP, and SP on CP

To test effects of the presences of CP, which was assumed to be related to participants' critical thinking level, multiple regression analyses were performed with EP, TP, and SP as predictors and CP as the dependent variable (Table 13). The assumptions of collinearity diagnostics were met. The predictors explained 58.4% of the variance in CP ($p < .001$). EP, TP, and SP had significant positive effects on CP, namely EP ($\beta = .423$, $p < .001$), TP ($\beta = .233$, $p < .001$), and SP ($\beta = .264$, $p < .001$).

Table 13

Multiple Regression Analyses of EP, TP, SP, and CP (n=126)

	CP		
Variable	B	SEB	β
EP	0.50	0.10	.423***
TP	0.22	0.06	.233***
SP	0.26	0.07	.264***

Note: Adjusted R (square) = 0.584 ($p < .001$) for CP.

***$p < .001$.

Effects of EP Dimensions on CP

To test effects of the EP dimensions on CP, multiple regression analyses were performed with the four dimensions of EP as predictors and CP as the dependent variable (Table 14). The assumptions of collinearity diagnostics were met. The four dimensions of EP explained 51% of the variance in CP ($p < .01$). Three dimensions of EP, namely interest-curiosity ($\beta = .38$, $p < .001$), expression management ($\beta = .19$, $p < .01$), and emotional regulation ($\beta = .31$, $p < .001$) had significant positive effects on CP. Only emotional awareness did not positively affect CP ($\beta = .1$, *n.s.*).

Table 14

Multiple Regression Analyses of the Dimensions of EP on CP

	CP		
Variable	B	SEB	β
Interest-curiosity	0.28	0.05	.375***
Emotional awareness	0.09	0.07	.100
Expression management	0.18	0.07	.188**
Emotional regulation	0.25	0.06	.313***

Note: Adjusted R(square) = 0.51 ($p < .001$) for CP.

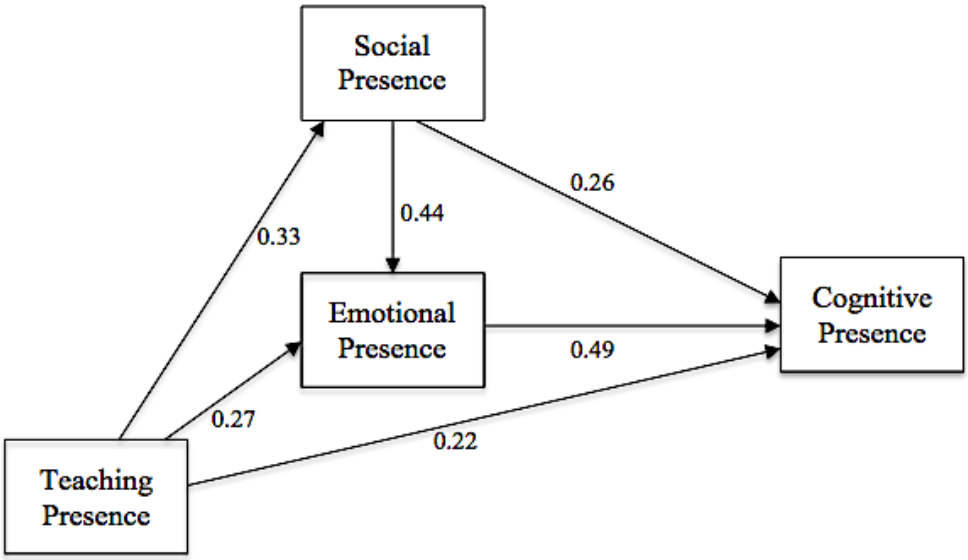
*$p < .05$. **$p < .01$. ***$p < .001$.

Effects among EP, TP, SP, and CP

Results from both quantitative (Research Question 3.1) and qualitative data (Research Question 3.2 and 3.3) revealed possible effects between the presences. Building upon these clues, the researcher hypothesized a model that portrayed the relationships among the four constructs. Path analysis was used to test the possible effects on the hypothesized model. The analysis was conducted using R studio version 3.6.2. The sample size fulfilled the requirements of five to ten observations per parameter (Bentler & Chou, 1987, p.91). The hypothesized model is displayed in Figure 4, with TP, EP, and SP as independent variables and CP as the dependent variable. Results from the CFA analysis revealed that the model fits the data (Chi-squared, χ^2, $p > 0$, *CFI* = 1.000, *TLI* = 1.000, *SRMR* = .000, *RMSEA* = .000). Although a non-significant χ^2 value is preferred, a significant value should not be a matter of concern as it is subjected to sample size sensitivity (Bentler & Bonett, 1980; Hu & Bentler, 1999).

Figure 4

Standardized Path Coefficients of the Hypothesized Model



As seen from Figure 4, there was a direct effect between TP (0.22), EP (0.49), and SP (0.26) on CP. Surprisingly, EP had the strongest direct effect on CP, which indicated that CP was highly dependent on EP. Both TP and SP had an indirect effect on CP. Total indirect effect of TP on CP was 0.29 (0.33*0.26+0.33*0.44*0.49+0.27*0.49). Hence, the total effect of TP on CP was 0.51. Total indirect effect of SP on CP was 0.22 (0.44*0.49). Total effect of SP on CP was 0.48.

Differences in the Pattern of Knowledge Construction between the Three Lowest and Three Highest EP Groups

To investigate Research Question 3.2 (*What, if any, are the differences in the pattern of knowledge construction between the lowest and highest EP groups in an inquiry-based online discussion?*), online discussions of the three lowest and three highest EP groups were analyzed using content analysis. A total of 577 messages extracted from six groups were coded using the revised coding scheme of the CoI framework. Two areas

related to knowledge construction were found to have notable differences: (i) levels of CP attained, and

(ii) interaction pattern.

Levels of CP Attained

Taking CP as the learning outcome or dependent variable for this task, the categorization of messages in online discussions according to the levels of CP was carried out. Altogether there were 324 messages that were coded as CP. The coding frequency results of the three lowest EP and the three highest EP groups are presented in Figure 5 and Figure 6.

The three levels of inquiry learning of CP in this task were *triggering events*, *exploration, and integration*. According to the Practical Inquiry Model of CoI framework, triggering events is the lowest order of CP, followed by exploration and integration. The highest level of CP is *resolution*, but it was excluded from the coding process because the task did not require resolution to occur. In fact, the dimension of resolution was only involved after this task ended, when students were required to create a product of media translation.

As can be seen from Figure 5, almost half of the amount, or 49%, of the total messages among the lowest EP groups were at exploration level. Messages of triggering events formed 33%, while integration had the least percentages of all, at 18%. As for the three highest EP groups (see Figure 6), 30% of the total messages fell in the triggering events category, 38% in the exploration category, and 32% in the integration category.

Figure 5

Results of the Analysis of CP among the Lowest EP Groups

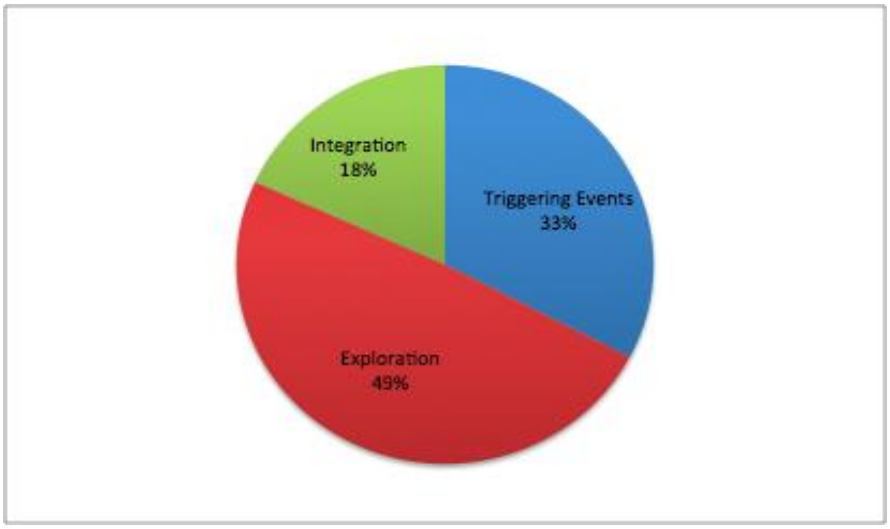
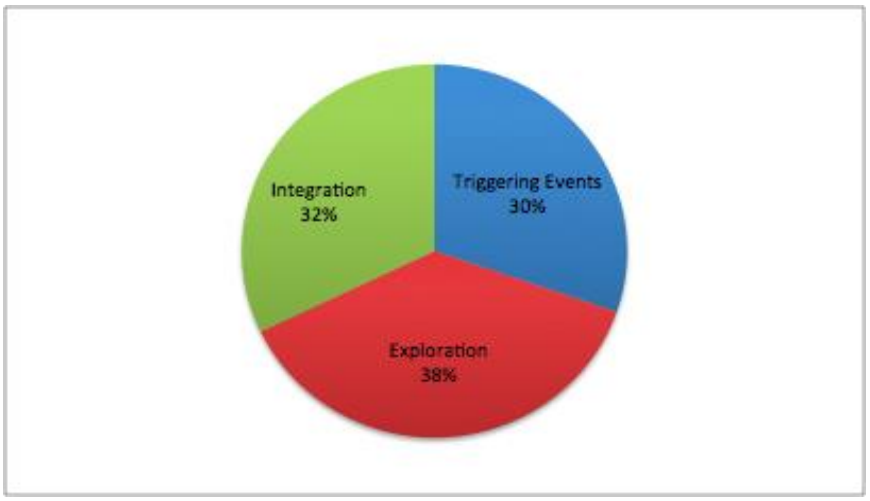


Figure 6

Results of the Analysis of CP among the Highest EP Groups



Two notable differences between the lowest and highest EP groups are the number of messages classified as exploration and integration: the lowest EP groups have 11% more messages at exploration level, and 14% fewer messages at integration level. In short, this means that the lowest EP groups, when compared with the highest EP groups, spend more

time exploring different topics of discussion than they do delving deeper into a particular topic.

Interaction Pattern

The interaction pattern among the group members was tracked on Moodle. The online discussions of each group were tracked in terms of the trend in the flow of posts and replies, communication etiquettes, and the direction of discussion. The differences between the lowest and highest EP groups are explained below.

Lowest EP Groups: Diverging and Individualistic. The discussion of the three lowest EP groups showed a similar pattern of knowledge construction that was diverging and individualistic in nature. An example of this pattern of knowledge construction is displayed in Appendix N-1.

From the discussion threads, it was found that some students focused on 'discussing' their own ideas without interacting with each other. While there were many ideas explored, the interaction diverged widely into various angles on the films. There were occasions where a topic posted was ignored, and the replies that followed focused more on writing own ideas, albeit generally agreeing with the other members' posts. Overall, group members focused on sharing their own ideas rather than going deeper into a topic. This diverging pattern of knowledge construction is consistent with the results obtained from content analysis, of which the categories of *EX1 Exploration within the online community* and *EX2 Exploration within a single message* constitute the majority of the CP construct. Furthermore, most of the replies to a post were generally short, without further elaboration (see Appendix N-2). Upon tracking the time and date of posts and replies, the participants started the discussion either the day before or on the actual day of the deadline.

The overall knowledge contribution was considered shallow due to certain characteristics found. Firstly, there was a lack of elaboration on how a topic was related to media translation between the two films. Secondly, instead of giving new insights or perspectives, some repeatedly shared what was already known from the films. In conclusion, the construction of knowledge failed to delve deeper into a topic and the interaction was not cohesive despite participants keeping their politeness throughout.

Highest EP Groups: Converging and Interactive. The interaction of these groups mainly flowed in a converging pattern, narrowing deeper into a topic posted. Replies from one tended to build on the previous posts of other group members. An example of this pattern of knowledge construction is displayed in Appendix N-3.

Overall, the discussions of the participants were more elaborative, such as providing clear explanations or examples. They were also able to justify and develop their points with clarity. On certain occasions, participants were comfortable in expressing differing opinions or counterarguments, while maintaining a sense of respect for each other. Some started with '*I understood your point about …, but I wonder ….*', and continued pursuing a query from a previous post. They were able to integrate the ideas or opinions of others and pursued the topic deeper. Consistent with the content analysis, most of the discussions were able to reach the *Integration* level of CP, which mainly belonged to two categories of codes: *IN1 Integration among group members* and *IN2 Integration within a single message*.

There was a lot more dynamic interaction among group members in response to each other's posts. In general, group members tried to acknowledge the contribution of others. For instance, they gave positive responses to each others' posts while keeping a level of respect for others' comments, with remarks like '*I agree that ….*', '*as some of us have mentioned, …*', or '*I thought, in addition to your comments, …*'. Some of the

members also gave compliments to the opinions of others, with remarks like 'I *think that was an interesting observation*' or '*I think that your opinion is very interesting*'.

In conclusion, the discussion of the three highest EP groups converged in a focused direction, topics were more critically explained and discussed while maintaining a fair level of social interaction among participants.

Students' Perceptions of EP

To investigate Research Question 3.3 (*How do students perceive EP in an inquiry-based online discussion?*), semi-structured in-depth interviews were conducted on nine students who participated in the online discussions. The findings were presented in five main areas: (1) emotive experience, (2) emotional awareness, (3) expression management, (4) emotional regulation, and (5) relationships with TP and SP.

Emotive Experience

Students reported experiencing a wide range of emotions during the task. Interest-curiosity constituted the highest percentage (18.8%) among all codes. Interest-curiosity were largely connected to epistemic-related activities like knowledge sharing and idea development. Participants reportedly attracted by new perspectives which triggered their innate sense of curiosity and gave them 'a sense of new discovery'. For example, Student-A recalled at one time, the discussion made her feel like '*almost seeing the film from someone else's eyes*'. It sparked her curiosity of how someone came up with certain interpretations, and as a result, curiosity prompted her to re-watch the films to gain new understanding.

Discussions that did not offer interesting ideas on a plate, in contrast, caused students to fall out of interest-curiosity quickly. These opinions were perceived as 'shallow answer', 'average opinion', and 'not interesting'. Student-A, -B, -D, -G, -H and -I felt that the shallow opinions were contributed by some members who joined near the deadline,

mainly aiming to post something to simply get the task done. These include giving similar opinions or restating an opinion stated earlier in the discussion.

At the same time, participants also reported to have experienced a range of negative emotions during the task, the most common one being 'negative emotions in general', followed by confusion, frustration, dislike, among others. The perception of the participants on group members' online attitude shaped most of their negative experience, among which were the *get-it-done* attitude for the task nearing the deadline. Besides, online empathy was perceived lacking among some Japanese counterparts. Student-C is reported as saying, *'I disliked the fact that people were writing in Japanese sometimes, because I felt they do not think about other people. Some people may not know Japanese yet, and the class is in English, so it's understandable….'*

In addition, it is important here to highlight a few other findings related to the cause of the negative emotions. First, emotional safety was perceived to be lacking in online platforms. Student-F expressed feeling worried and nervous over digital footprint issue, where online comments will leave a permanent trace on the platform, and therefore, paid more careful attention to the appropriateness of word usage in writing. Student-H recalled not feeling comfortable or safe enough to disclose his actual thoughts and feelings in online discussion. He said *'..it could have happened that some people might feel uncomfortable due to the misunderstanding happening in an online environment, because we cannot express our feelings or understanding in a physical way, like face expressions or other body languages'.* Second, the issue of online identity was raised. It was perceived that the higher sense of online anonymity would lead to higher emotional safety. In relation to this, Student-A commented that she was more willing to state her comments in online discussion than doing so physically in front of the whole class. Student-I recalled that the sense of anonymity allowed her to be herself without concern for what other people might

think of her. Third, online comparison between members was prone to happen: Student-F opened about feeling pressured to meet certain standards because she would compare the quality of comments posted among them. Meanwhile, Student-H would compare how good his comment was based on the number of replies received.

Emotional Awareness

The findings revealed that most of the participants, except Student-A, -B, and -E, were aware of their emotions during the task. Student-F felt that communicating on an online platform required a high awareness of emotions because she was unable to see the facial expressions of another, and as such, could not say freely whatever she had in mind. She took extra precautions to check if her comments would reflect any negative emotions she was experiencing at the time of writing, to avoid causing offense to the reader. Others reported being aware of the time when they felt frustrated, confused, or happy while doing the task. However, Student-A commented she was not aware of her emotions during the task, citing, as reason, the fact that she was not very aware of her emotions in general.

Speaking about others' emotions, all except Student-H could not sense them through the discussion content. One of the reasons mentioned was people trying to maintain a polite and friendly climate in the online discussion, repeatedly agreeing to others' comments.

Expression Management

The findings, as expressed, reveal that while most participants were aware of their own emotions during the task, they chose not to express them in the online discussion. The main reason for doing so is because it was inappropriate to the task or purpose of the discussion group. In general, they perceived the task to be a formal academic assignment, where it was not appropriate to reveal unnecessary emotional expression. Student-E perceived this as a task to complete and did not engage in any emotional conversation.

Additionally, Student-H explained that it was unlike other social chat groups, such as dormitory chat groups, where the purpose was primarily for socializing, and using informal emotional expression was common.

Besides task appropriateness, taking others' feelings into consideration and the impact of their own words on another was yet another reason for controlling their expression of emotions. Student-F felt that communicating on an online platform required an extra cautious approach. Compared to f2f conversation, she needed to use imagination to predict how the words sounded back to her, and therefore how they sounded to others.

Emotional Regulation

The analysis of participants' answers revealed that the participants adopted three kinds of emotional regulation strategies. The most common being *adaptability*, where participants accepted the situation as it was. Student-A and -H, grew accustomed to the experience as the situation which was beyond their control. The strategy was employed mostly in cases related to last-minute participation. The second strategy was *positive refocusing*. In situations within their control, Student-A, -E, -F and -H took positive actions in the hope of changing the situation for better, an example being, Student-E was once misunderstood by other group members concerning her comment and resorted to clarifying her own thoughts and checking on her language before she posted more. In contrast, one participant used an *attentional control strategy* to manage her negative emotions; Student-G said that she tried not to think about it and kept herself busy with other work when she received no replies from other group members.

As for positive emotional regulation, two participants mentioned that they were prompted to re-watch the films to search more for information on the new perspectives raised, which triggered their curiosity. This strategy was also considered as *positive refocusing* where positive actions were taken to 'appease' the sense of curiosity within.

Relationships with TP and SP

Interview analysis also revealed the connections between EP and two other presences: TP and SP. All the participants felt that despite the teacher's infrequent involvement in the online discussion, her comments were perceived as 'instrumental', 'positive' and 'stimulating'. One reason was that they perceived the teacher's contribution to be a source of cognitive support and an epistemic motivator. Student-F recalled, '*...the teacher had more insightful views on the particular topic, I think I kind of relied on what she said, more than other students' comments, I think. Even though she only commented once.*' Participants generally viewed TP as a source of motivation, providing the sense of direction to the discussions. They reportedly enjoyed seeing her basis for their interpretations and used this to gauge if they had the right understanding. Additionally, TP had also spurred the interaction among them, as participants felt that people started to post more after the teacher commented on the discussion.

As for SP, participants found themselves being constantly influenced by their group members. As aforementioned, their perceptions of members' attitude, interaction behaviors, and quality of knowledge construction had played a part in the formation of EP. Overall, participants perceived low SP throughout the activity because most students did not display own photo in their Moodle account, although real name identification was made available. They felt like strangers to each other, and communication did not go beyond the online discussions. Statistical analysis results confirmed this finding, where the mean of SP was the lowest value among all the four presences. Nevertheless, there was one participant who felt the urge to know another team member in the real setting because of the interesting ideas contributed to the discussions. In conclusion, the quality of team members' discussion content, which is CP, can have an influence on SP within the group.

Discussion

Study Three examined the concept of EP in the educational transactions of an inquiry-based online discussion within a CoI, resulting in the discovery of complex and dynamic interplay among the four presences. EP emerged to be the strongest predictor of CP. The findings of the study presented clear evidence that EP was an essential part of learners' educational experiences affecting three other presences.

EP as an Essential Component for CP Development

Consistent with the researcher's expectation, EP was found to be associated with CP: among all three presences, both correlational and path analyses found EP to have the strongest correlational value and predictive power on CP.

This result sheds new light into the research on the interdependence between affective and cognitive domains in education and is consistent with the assertion made by cognitive and clinical psychological research about the interdependency between emotion and cognition. In a clinical experiment, Gray et al. (2002) used fMRI to assess brain activity in the lateral PFC (prefrontal cortex) of 14 participants who performed a demanding cognitive task after watching an emotional video. Data showed that emotional states can influence working memory and brain activity in the lateral PFC, establishing the conjoint effects between working memory and emotional states. In the cognitive neuroscience area, Phelps (2006) reviewed areas of research that displayed the role of human amygdala (i.e. a brain structure identified as crucial for emotional processes) on the interaction of emotion and cognition. The review concluded that 'the mechanisms of emotion and cognition are intertwined' at all stages of stimulus processing (p.46) (i.e. from early perception to reasoning). Phelps further suggested that it was somehow unrealistic to view emotion and cognition as separate divisions and that research about human cognition should take into consideration the function of emotion.

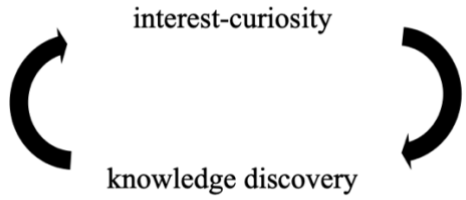
Interest-Curiosity and CP

The dimension of *interest-curiosity* was significantly correlated with all dimensions of CP, with additionally, correlational values between EP with the lower phases of CP (i.e. *triggering event* and *exploration* phases) being higher than the higher phases (i.e. *integration* and *resolution*).

It is speculated that at these lower phases, learners encountered cognitive disequilibrium more often as they were triggered by new knowledge, or knowledge more complex than their current understanding level. Such encounters thereby evoked emotion of interest-curiosity within the student. The result is consistent with the knowledge gap theory of Loewenstein (1994) and novelty-complexity theory of Silvia (2010) that epistemic emotions arise when there is a knowledge gap, where new knowledge could appear as something novel or more complex. Parallel with the interview findings, participants were mostly captured by new perspectives interesting to them which prompted a sense of discovery within; some were driven to rewatch the film to gain deeper understanding. When learners encounter a state of cognitive disequilibrium, both EP and CP seem to work in a reciprocal feedback loop of dynamic interaction (as shown in Figure 7), where the identification of knowledge gaps in novelty and complexity lead to increasing interest-curiosity. Subsequent interest-curiosity serves as the inner drive in knowledge exploration. This finding supports Pekrun's (2006) assumption about the dynamic interaction between emotion and learning, where he posited that both elements operate in a loop of reciprocal causation that affect each other simultaneously (p.327).

Figure 7

Reciprocal Causational Relationship between Interest-Curiosity and Knowledge Discovery



From this, it seems that EP played the roles of a *navigator* and *motivator* in the current study, sustaining inquiry learning for deeper and more meaningful learning. As a navigator, EP provided a sense of direction that focuses learners' perceptions on parts of information which are important or interesting, or on situations that need thoughtful decision making, which alignes with Elgin (1999). Other researchers have expressed similar views that emotions or emotional experience is itself a piece of information (Ballard, 2021; Romano, 2018), providing content with evaluative properties that form beliefs, value, and judgment to objects or situations. As a motivator, EP functions as an inner force to sustain knowledge acquisition and construction. The concept of emotions being motivational in nature has been widely noted, for example by Deonna and Teroni (2012); and Scarantino (2020, p.120). In conjunction with CMRT, emotion has a *motivational* aspect responding to personal motivation; goals, beliefs, and values that could be influenced by societal and cultural values (Lazarus, 1991a, p.618).

Emotional Regulation and Knowledge Exploration

Interestingly, the results of this study found that at the dimensional level, *emotional regulation* (of EP) and *exploration* (of CP) had the strongest correlational value. In online learning, learners interact with the content, interface, learners, and instructor(s) (Hillman et al., 1994; Moore, 1989) in the process of exploring knowledge. It is believed that multiple

practices of knowledge negotiation are involved during the exploration stage. Knowledge negotiation was found to involve deciphering the quality of content shared, such as credibility, depth, correctness, and novelty. Such practices, whether internally or externally, usually happen in group knowledge construction processes (Stahl, 2003). This is in line with distributed cognition theory which states that knowledge is shared and distributed among a community of learners and is not solely limited to an individual's mental representations (Hutchins, 1996). In addition, this explanation supports Dewey's (1938) theory of inquiry which states that the construction of meaning (or new knowledge) happens as a result of the interaction between personal interests and social inquiry.

Ongoing knowledge negotiation processes could potentially elicit positive or negative emotions. In the current study, learners reported experiencing negative emotions when they encountered issues related to reading repetitive ideas, shallow opinions, and confusing use of language. The complexity of emotive experience can cause emotional and motivational fluctuations in the educational process (Alonso-Tapia et al., 2020). Emotional regulation was necessary in such instances to quell negative emotions, boost positive emotions and goal-striving motivation (p.75). These findings showcase the importance of ongoing emotional regulation activities that take place during the knowledge exploration phase within a community of learners. Moreover, emotional regulation which, is also considered a part of self-regulated learning, becomes a process crucial for a sustainable exploration of knowledge (Wolters et.al., 2011). Past research pointed to the possible link between emotional regulation and motivational regulation (Wolters, 2003) in persisting in the undertaken task or in achieving learning goals. Learners who are more motivationally oriented in the task assigned are also those who can effectively regulate their emotions (Alonso-Tapia et al., 2020).

Task Formality Influences the Extent of Emotional Expression

It is not surprising that very little emotional content was found in the discussion transcripts of the current study, as participants mostly perceived this task as a formal academic discussion that did not involve any emotional or colloquial language, a reaction consistent with the study by Burić et al. (2016) who found that expression of emotions in academic settings is commonly regarded as inappropriate (p.145). However, this scenario is inconsistent with the study by Cleveland-Innes and Campbell (2012) who used online conferencing transcripts to investigate emotional content in regular student engagement and interaction. Explanation can be found in the fact that the nature of such forums is less formal, compared with the task in the current study where students were required to discuss critically in an academic manner. The narrow conceptualization of EP by Cleveland-Innes and Campbell is foreseen to pose a challenge in a formal online discussion with little emotional content.

Findings from the interviews revealed that participants, in the main, evaluated three things: the task purpose, expression appropriateness, and online identity within the group, before deciding on whether to express their feelings. Most chose not to express their emotions directly but prioritize projecting a positive online identity. This result is consistent with studies on social display rules where people may disguise their true feelings in social contexts to promote positive interpersonality or infer the desires of another (Wu & Schulz, 2020). Such a scenario is also known as *emotional dissonance*, a conflict between one's experienced emotions and expressed emotions to conform to social display rules (Hochschild, 1983). Emotional dissonance has been found to be associated with somewhat negative traits such as emotional exhaustion, stress, and counterproductive work behavior (Cretu & Burcas, 2014; Kenworthy et al., 2014; Tewksbury & Higgins, 2006). These studies are biased slightly in that they were based in the working context

where commitment and performance were a priority and not in an academic setting where few studies have been conducted to date.

The current study also revealed that *expression management* of EP has a significant and moderate relationship with *open communication* of SP. The higher the learner assesses the appropriateness of projecting emotional content in OLEs, the higher the perceived level of openness in communication, possibly indicating development of SP may be fostered through a higher level of expression management, but at the cost of experiencing emotional dissonance.

The Mystique about Emotional Awareness

Multiple regression analysis results showed that *emotional awareness* was nonsignificant on CP, meaning this dimension did not significantly predict CP. Correlational analysis showed that emotional awareness had weak associations with all dimensions of SP and TP. However, there was association found with the dimensions *within* EP itself, where it was moderately correlated with *expression management*, and almost as strongly correlated with *emotional regulation*. These findings reveal that emotional awareness played a more significant role in the within-construct level than in the between-construct level, influencing one's control in expressing emotions, and regulatory strategies. Higher emotional awareness signifies higher cognitive ability to perceive, describe, and differentiate emotional experiences in oneself and in others (Lane and & Schwartz, 1987), consequently leading to better emotional regulation (Barrett et al., 2001; Boden & Thompson, 2015).

Also, an individual may or may not be aware self emotions experienced during the process. Such diverging results reveal the complexity of individual differences in their perceived level of emotional awareness. Nonetheless, irrespective of one's level of emotional awareness, an individual could still be discovered using various strategies to

regulate negative emotions, or to appease positive emotions for deeper learning. This is in accordance with Gyurak et al. (2011)'s *dual process of emotional regulation framework* which explains that emotional regulation processes can be effortful (i.e. explicit) or autonomous (i.e. implicit). Explicit regulation processes are said to be associated with a degree of insight, awareness, and conscious effort (p.401). In contrast, implicit regulation processes could happen *without* insight, awareness, and monitoring effort (p.401). This helps explain the variations in participants' accounts on their emotional awareness in the current study.

The weak association of emotional awareness with other presences in this study was somewhat different to past research. Past research found that emotional intelligence, which includes emotional awareness properties, was positively associated with interpersonal relations constructs such as empathy, social and cooperative skills (Schutte et al., 2001). One possible explanation of the current findings is that due to the lack of emotional content expressed through text, they felt that they were not aware of others' emotions. The low perception of emotional awareness seems to be influenced by the type of task undertaken. Further research, which takes these variables in account, will need to be done to resolve these discrepancies.

Discussion Platform and Emotional Safety

The study additionally identified the relationship between the nature of discussion platform and the extent of emotional safety, even though this was not a part of its remit. Different to f2f settings, text-based communication leaves a record traceable in an LMS. Digital footprints, which refers to traceable data manifested on the internet, becomes an inevitable issue for some participants, leading to a lack of emotional safety in online discussion. Emotional safety is defined as 'an experience in which one feels safe to express emotions, security, and confidence to take risks and feel challenged and excited to try

something new' (The National Center on Safe Supportive Learning Environments, U.S. Department of Education, n.d.). This manifested as participants feeling the need to carefully check on their writing in the online platform.

Schepers et al. (2008) found that emotional safety is positively associated with reduced anxiety, goal achievement, engagement, and motivation. The lack of emotional safety in group discussion reflects the lack of interpersonal trust, a sense of being valued and feeling comfortable (p.758). Moreover, Shea and Bidjerano (2009) found that comfort in participation in online discussions was positively associated with CP. Consequently, epistemic engagement of online discussions suffers with reduced emotional safety. In conclusion, the results of this study imply that emotional safety is an important factor in the development of CP and SP.

Some participants such as Student-A and -I, on the other hand, had the opposite experience, and felt comfortable expressing themselves because of a high degree of online anonymity. If online anonymity does, in fact, lead to higher emotional safety for discussion, the implication may be that one can express true feelings without fear or repercussions, even on an unpopular topic. This agrees with Kilner and Hoadley (2017)'s findings that online anonymity could have a significant effect on the quality and productivity of discussions. When online anonymity was high, participants showed higher frequency in expressing negative feelings or thoughts; whereas, when online identification using real names was required, reputation became an important factor that influenced the comment quality (p. 278). This suggests higher online anonymity may be connected to higher emotional safety but decreased productivity in discussion content.

Chapter 6: Discussion and Conclusion

Chapter 6 summarizes the purpose and overall findings of the three studies while integrating the key points discussed in Chapters 3, 4 and 5, and presents a revised theoretical model of the CoI framework incorporating the findings. It closes by presenting the significance of this study to the growing body of research of the CoI.

Discussion

Summary of Research Questions and Key Findings

The main purpose of this research was to explore the concept, change, and effects of EP in a CoI of higher education learners. The initial theoretical model summarized in Figure 3, proposed EP as a four-dimensional construct namely *interest-curiosity, emotional awareness, emotional expression, and emotional regulation*, in accordance with the CMRT of emotion. EP was integrated into the existing CoI framework of three constructs: teaching, social, and cognitive presence. These four presences and their constituting dimensions were anticipated, to be interrelated, to a certain degree. The model aims to articulate a comprehensive educational experience within a CoI of higher education. Subsequently, following the findings of the three studies undertaken, a revised model was developed which will be discussed in the final part of this chapter.

Initially, Study One sought to investigate Research Question 1 (*What are the underlying dimensions of emotional presence in the higher education context?*); the main objective being to explore the concept of EP based on the CMRT of emotion through developing a reliable and validated instrument called EPS. Study One successfully confirmed EP as a first order, four-factor structure, in line with the proposed EP structure in the initial theoretical model. Adequate reliability of the scale and of each dimension were shown. Most importantly, the underlying dimensions of EP were shown to be consistent with the CMRT of emotion, the theoretical base of EP in this research.

Using the EPS created, two separate studies were conducted in inquiry learning activities at a Japanese university. Study Two sought to investigate Research Question 2 (*How does EP change over time and correlate with CP and task outcomes of an inquiry learning activity?*). The main objective being to examine the change of EP and its relationships with the learning process and task outcomes. Study Two revealed that EP changed over time in the inquiry learning activity, confirming that it was dynamic in nature. All dimensions of EP showed an increase in mean value at the end of the inquiry learning activity. The change in EP occurred in accordance with the concomitant tasks and demands of the inquiry learning activity, reflecting learner's adaptation process in learning. This finding was consistent with the proposition of the CMRT of emotion describing the occurrence of emotions as dynamic experiences in the ongoing adaptation process of a person-environment relationship. Furthermore, the change of EP was correlated to knowledge acquisition (represented by CP) and the main task outcome (lesson plan rating). Further analyses revealed that the *increase of emotional regulation over time* was essential to regulate continuous occurrences of positive and negative emotive experiences in a complex, collaborative task. Adoption of effective emotional regulation strategies was found to be important for self-regulation learning. Specifically, 'satiating' the interest-curiosity had an influence in knowledge acquisition in the learning process and direct task output. Conversely, coping with negative emotive experiences using effective emotional regulation strategies, was essential to building positive collaborative relationships among team members, which influences task output quality.

Study Three sought to investigate Research Question 3 (*What is the dynamic interplay between EP and other learning constructs in an inquiry-based online discussion?).* The main objective of this study was to investigate the dynamic interplay between EP and the three CoI presences that influence epistemic engagement (with CP as

the perceived learning outcome), through exploring the interrelationships between and among them. Correlational analysis revealed that EP was correlated to all CoI presences, with EP and CP having the strongest correlational value. Transcript analysis of online discussions revealed that high EP level groups achieved higher levels of CP. Study Three confirmed the propositions of the initial theoretical model of this research that the four presences were interrelated with each other. Discovering the factors that influenced these relationships led to the revelation of the roles of EP as a navigator and motivator in inquiry learning. Finally, a path analysis depicting the relationships between the four presences was presented, showing that four presences were interconnected with each other in a complex way. EP was found to have a direct effect on CP, as well as mediating the effects between TP and SP, as well as SP and CP.

Key Discussion Points

Concept of EP and Dimensions of EPS

This research differs from the previous work, specifically that of Cleveland-Innes and Campbell (2012); Sarsar and Kisla (2016); and Stenbom, Hrastinski, and Cleveland-Innes (2016), on the conceptualization of EP. Previous work's definition of EP as the 'outward expression of emotions' was viewed as *narrow and limited*. The findings of both Study Two and Study Three confirmed that EP might not be traceable in online discussions explicitly, or directly expressed in collaborative group work. A large part of learners' EP was found lurking within their innermost construal of the situations and coping of interpersonal emotive experiences *intrapersonally*. Emotions are postulated to be 'fundamentally implicit processes but they interact with explicit processes' (Sun & Mathews, 2012, p.110). Undeniably, cultural factors may play a part in emotional expressions of online academic discussion (i.e. Japanese culture) or f2f communication. A narrow definition of EP, therefore, will hinder future researchers in capturing a

comprehensive view of learners' experience of emotions *beyond* text-based online discussions, such as in a f2f or blended learning setting (Archer, 2010). The researcher argues that the new definition of EP put forward in this research is more comprehensive and useful to propel future work in this area.

EPS was first developed in Study One as a four-dimensional construct based on the CMRT of emotion, and subsequently the 16-item scale was employed in the data collection of Study Two and Study Three. In both subsequent studies, adequate reliability of EPS was reported on two different samples, demonstrating that EPS possesses a good degree of reliability, particularly among the Japanese students, with more studies needed to be conducted on different populations. The four dimensions of EP were theoretically sound and proven important based on the fact that they were well discussed by participants during interviews. As proposed in the initial theoretical model, EPS could adequately measure EP and were appropriate for the purpose in the CoI context. Therefore, we can state: EPS may serve as a reliable, validated, and useful tool to assess EP within a CoI of higher education.

Change of EP in Inquiry Learning

The change of EP was revealed by Study Two where participants generally experienced an increase in EP at the end of the inquiry learning activity. In Study Three there were also accounts of EP's dynamic nature being reported. Most participants experienced an increasing level of interest-curiosity on new perspectives but fell out of the same emotion when encountering discussions with shallow or repeated ideas. While it may not be clear, at the present time, how erratic were the changes of EP with time over the whole process of inquiry learning, one definite finding was the inquiry learning process was itself a dynamic process encompassing different episodes of learning path. In the case of Study Two, the microteaching activity unfolded into a few phases with differing

demands, goals, and complexity. Since the duration of the microteaching activity was considerably brief, two-time points measurement was considered sufficient to capture the change. In Study Three, although the online discussion did not show clear learning phases as in the microteaching activity of Study Two, the one-week discussion timeline could be categorized into beginning, mid, and near-deadline phases. Reports from participants revealed high levels of frustration concerning the near-deadline discussion posts, which were rushed and shallow. It is therefore recommended that future research explore the fluctuation of EP's changes by conducting a time series analysis over a longer duration inquiry learning activity. Possible trends of EP changes with respect to phases of inquiry learning activity could well emerge from this line of research.

The CoI framework was postulated as a dynamic model describing educational experience in collaborative knowledge building among a community of learners (Garrison, Cleveland-Innes, & Fung, 2010). Some studies have confirmed the dynamic nature of the three CoI presences. Akyol and Garrison (2008) explored the dynamics of TP, SP, and CP using transcript analysis of online discussions among 16 graduate students; their findings revealed that all three presences were dynamic, with TP and SP changing significantly over time. The changes, however, were very much dependent on the design of learning activities. Kozan and Richarson (2014) revealed that two important factors: the learning profile and learning context could influence the fluctuation of the interrelations between the CoI presences. Study Two of the current research, has successfully shown that EP is dynamic in nature and could therefore suitably be considered as a fundamental element of the CoI framework.

Relationships among EP, TP, SP, and CP

Consistent with the initial theoretical model of this research, EP was found to be associated with all CoI presences. The establishment of the relationships among the four

presences is displayed in the revised model in Figure 8. These results somewhat match those observed in earlier studies where three CoI presences were found to be interrelated (Akyol & Garrison, 2008; Kozan & Richardson, 2014). The distinct difference of this study, compared to the previous ones, is the inclusion of EP in the CoI framework. In the current study, EP emerged to have the strongest association with CP, indicating that EP is crucial in promoting CP in online discussions. Among all CoI presences, EP had the strongest predictive power on CP. This will be the first study to show predictive effects among *four* presences within the CoI framework.

Figure 4 shows the model generated from path analysis revealed EP as the mediating variable between SP and CP, as well as TP and CP. Unlike previous research showing only SP as a mediator (between TP and CP) (Shea & Bidjerano, 2009; Garrison, Cleveland-Innes, & Fung, 2010), this study revealed the importance of the mediating roles of EP when interacting with other presences. It indicated that the affective dimension of learning experience *could not be separated* from all other learning constructs. For instance, learners with a low level of SP will most likely experience low social engagement in online discussion which may hamper the formation of CP. EP, which functions as a mediator between SP and CP, played an important role in this process. Emotional regulation becomes crucial to mitigating negative deactivating emotions, such as frustration and stress, as well as contributing to improved self-regulated learning. Subsequently, EP may in turn contribute to the development of CP. Understanding the role of EP as mediator is crucial to promoting the development of CP in an online CoI.

Further, both TP and EP were shown to have direct and indirect effects on CP. With the inclusion of EP, the scope of TP is enlarged with increasing complexity. The researcher suggests a shift in the perception of TP. In the past, TP was viewed to be the main construct in promoting CP (Garrison, Cleveland-Innes, & Fung, p.31). This study

contradicted the findings of two studies (i.e. Garrison & Cleveland-Innes, 2005 and Shea & Bidjerano, 2009) that suggest TP has the strongest influence on CP. EP, rather, has been shown to have the closest relationship and strongest effects on CP. Nevertheless, this does not diminish the role of TP in the CoI. Under the new proposed model, the role of TP should be revisited and redefined. TP is perceived to be instrumental to the formation of CP, through enhancing EP and SP. A high level of TP could potentially promote a high level of EP (such as invoking interest and triggering the sense of curiosity among learners) for cultivating epistemic engagement. In conclusion, the enhancement of EP could not be done without the involvement of other presences, especially that of TP.

A Revised Theoretical Model for the Community of Inquiry Framework

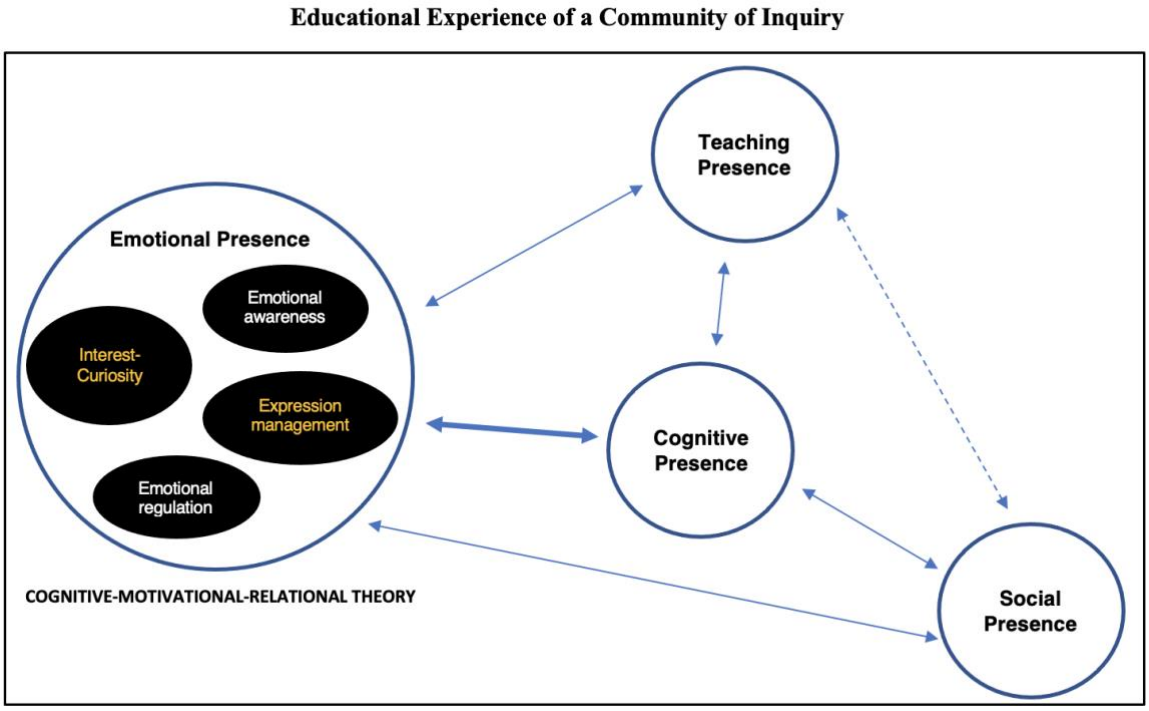
Based on the findings of this research, the initial theoretical model, Figure 3, was modified in a few areas. Figure 8 shows the revised theoretical model of the CoI framework.

First, the labels of the EP dimensions were changed slightly according to the findings of Study One. *Epistemice emotive experience* was renamed *interest-curiosity* because the retained items consisted only of interest and curiosity emotive experiences. *Emotional expression* was renamed *expression management* as the items reflect appraisal of the learning environment that determines the suitability of emotional expression. Second, the double-arrowed lines which represent the correlational relationships between and among the presences were revised for more clarity. The lines are differentiated by dash type to represent the relative strength among the constructs. Bold line represents correlational values of $r \geq 0.7$; and dashed line for $r < 0.5$. Solid line represents the values in between these ranges. Comparing with the initial theoretical model, the associations of TP and CP, as well as CP and SP in this study were not of strong relationships as revealed by Archibald (2010), but of moderate relationships, hence, the use of a non-bold line

represent the relative strength. In line with predictions, EP and CP were found to be strongly correlated, of which this strength is represented by a bold line as in Figure 8 below.

Figure 8

Revised Theoretical Model of the CoI Framework



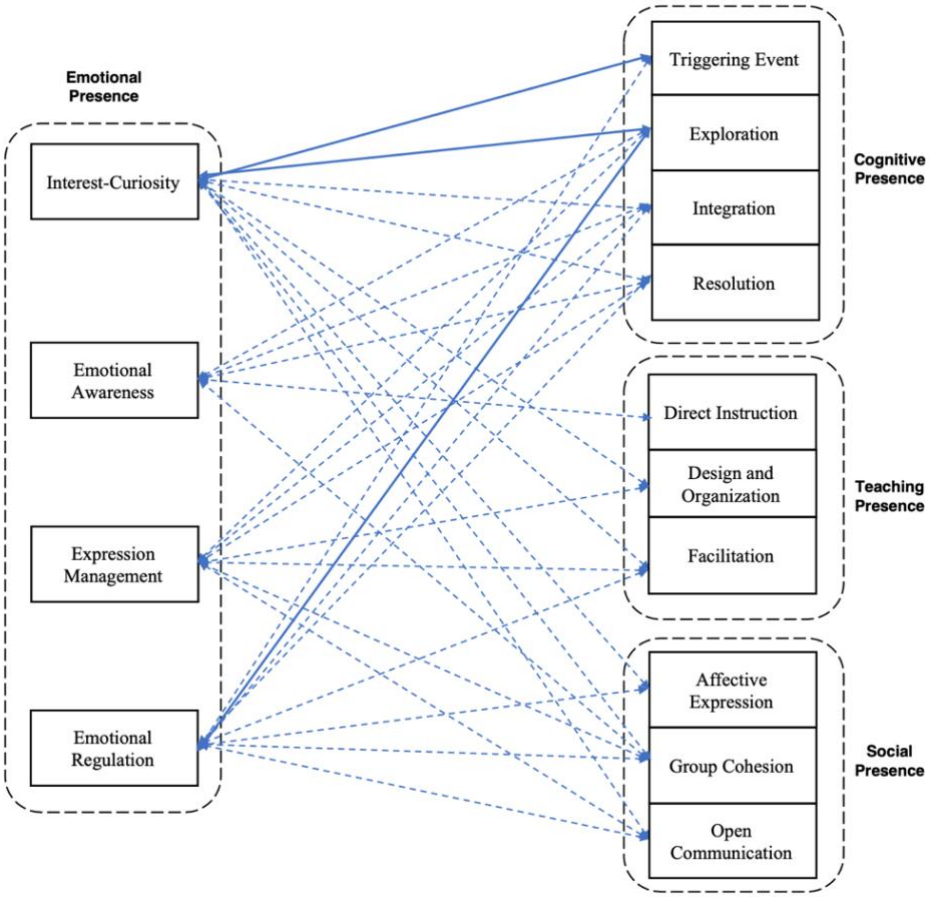
Note: Dimensions labelled in yellow font indicates a change of label after scale development.

At the dimensional level, EP's four dimensions were found to be associated with the dimensions of the three CoI presences. Overall, all the dimensions of EP were correlated in a complex way with the dimensions of three CoI presences. *Interest-curiosity* appears to be the most salient dimension. Figure 9 illustrates the correlational relationships between the constituting dimensions of EP with the dimensions of CP, TP, and SP. Similarly, a different dash type of line is used to represent the relative strength between the

dimensions for more clarity. In Figure 9, the solid line represents correlational values of $r \geq 0.5$. Weak association ($r \leq 0.3$) between dimensions are not shown. Dashed line represents the values in between these ranges.

Figure 9

Relationship Model of Emotional Presence with Three CoI Presences at the Dimensional Level



The revised model of CoI framework is a more comprehensive framework that articulates the CoI of higher education as compared to the existing three-construct framework. It shows that EP to be firmly grounded in the CMRT of emotion, which consists of four dimensions: *interest-curiosity, emotional awareness, expression management*, and *emotional regulation.* It also displays the dynamic interplay among the

four presences. The revised model is a new theoretical model that accomodates the affective domain of education experience, alongside the three original constructs. This study posits that the inclusion of EP will provide a holistic framework of educational experience of a CoI in higher education.

Conclusion

The main goal of this research was to examine the concept, dynamic, and effects of EP in a CoI of higher education. This research has successfully filled the gaps of past research in five areas: (1) reconceptualization EP on a strong theoretical base; (2) operationalization of the measurement of EP through a reliable and validated tool; (3) exploration of the dynamic nature of EP and its effects; (4) investigation of the interrelationships among EP, TP, SP, and CP; and (5) development of a revised and comprehensive CoI framework of four presences. Through this research, the roles of EP and the importance of each constituting dimension were ascertained.

Contributions

This research makes a noteworthy contribution to the growing body of research on EP and the CoI framework. It expands the scope of research on EP, led by Cleveland-Innes and Campbell (2012), through the exploration of EP's concept, nature, and relationships with other learning domains.

Theoretical Implications

Study Two extends our theoretical knowledge on the concept and nature of EP as well as its effects within other learning domains. The findings support the argument of the CMRT of emotion that the experience of emotion is dynamic and complex, and through tracking the changing adaptation of a person-environmental relationship such dynamism can be understood. This study has demonstrated, for the first time, that EP is also a dynamic learning element within a CoI. The current findings add to a growing body of

literature that supports the notion that the CoI framework is itself dynamic and interactive. Furthermore, the empirical findings of this study provide a new understanding of the relationship between the change of EP and both the learning process and outcome. The current findings shed new light on the existence of the relationships, demonstrating that the affective experience of the learning process is crucial to cognitive-related processes and outcomes.

Study Three has important implications for the existing CoI framework that emphasizes the importance of a sustainable CoI for a purposeful and collaborative knowledge construction. Firstly, this study extends the theoretical knowledge of the CoI framework into the affective domain of online educational experience by demonstrating that the new construct, *emotional presence*, is a substantial and indispensable element. Through EP, it captured affective educational experiences of cognitive appraisal, emotive experience, and regulatory processes. Moreover, this study demonstrates that the interplay among four presences involves complex interactions and reciprocity, and the roles of EP and its importance in fostering the development of CP has been determined. Ultimately, a revised theoretical model for the CoI framework has been developed, which does not diminish the importance of other presences, but redefines the roles of TP, SP, and CP for a successful collaborative learning experience among a CoI. It is hoped that the revised model becomes a useful theoretical tool to measure educational transactions in a CoI of higher education.

Suggestions for Practitioners

This research has several important implications for practitioners. Instructors and instructional designers can work towards designing inquiry learning activities potentially invoking the increase of EP along the learning process. They should make the most of the role of EP, both as a navigator and motivator, through designing lessons which trigger

learners' sense of interest-curiosity in areas of importance. For example, gradually decreasing the use of scaffolds in an activity can guide learners to explore knowledge based on their interest-curiosity; or giving the space and freedom to express their creativity in a learning activity can potentially invoke learners' interest-curiosity to venture new areas and encourage the expression of personal thoughts and feelings through their work and within the social learning community.

Moreover, they should also pay attention to technology-related issues that impede emotional safety in online learning. Considerations on maintaining a balanced level of online anonymity in discussion platforms as well as a fair number of emotional expressions among learners are both needed. It is important, in this day and age, to foster an open and safe emotional climate in online discussion. Instructional designers and instructors have the potential to build a sustainable learning community through enhancing EP in educational activities.

Finally, no previously existing instrument has been developed in accordance with the CMRT of emotion to measure EP. EPS measures both the internal and external experience of emotions, closing the gap left in previous EP scale development research (e.g., Cleveland-Innes & Campbell, 2012; Kang et al., 2007; Sarsar & Kisla, 2016) that mainly focused on the external emotional expression observational in text-based discussion. The findings of this research indicated that the EPS has adequate reliability and validity to be used as a good measure in assessing the affective domain of students' educational experience, particularly in the Japanese context. EPS may possibly be one of the few original instruments possessing a strong theoretical base and psychometric properties to assess EP. EPS will serve as an effective tool for instructors to measure the EP of a learning activity or a course within a CoI of higher education.

Limitations and Recommendations for Future Research

Limitations of the Research

Despite the contributions discussed above, some limitations need to be noted. For the reasons outlined below, caution in interpreting the results from this research is recommended.

First, the EPS is a self-reporting measurement that requires students to recall their experience of learning in a recent course. The limitations to such measurement are that the respondents might be lacking accurate self-knowledge. Similarly, the use of retrospective data in both Study Two and Study Three might be subjected to reconstructed information and self-presentational biases of the participants. Participants may have varying recollections of their actual experience or respond to portray images of themselves being the subject of negative stressors in social situations. Also, the willingness and capability of reporting emotions may be influenced by stereotyping and social desirability (Grossman & Wood, 1993; Mesmer-Magnus et al., 2006). Despite this, however, the short duration of the inquiry learning activities and the immediate conduct of the data collection may have minimized the errors of varying recollections.

Second, this research was situated in a Japanese learning environment and cultural background. It is limited by the sample tested as well as the sociocultural factors in which the studies were conducted. Nonetheless, this can become an advantage in understanding Japanese students' experience of emotions in learning within a CoI as most past studies were conducted in the Western context. Undeniably, more research is needed to replicate the results of the current research, in diverse contexts, disciplines, and tasks as these factors might play a part in influencing the formation of EP in online discussion.

Third, the final 16 retained items of EPS in Study One is yielded within the options used in EFA such as factor extraction and rotation. Orthogonal rotation, which is not attempted in this study, may yield similar or a slightly different result than oblique rotation.

Fourth, the findings of Study Two is limited to the small sample size studied. The moderate effect size of the change of EP, on that account, is considered small. It is strongly suggested that similar study be conducted on a larger sample to confirm the findings.

Fifth, Study Three investigated only one model using path analysis of the effects between four presences, leaving the possibility that alternate explanatory models exist. Nevertheless, despite the above limitations, the current study has sufficiently proven that EP is indeed a crucial element in the higher education of a CoI.

Finally, the position of the researcher as a Classroom Supporter or Teaching Assistant in both Study Two and Study Three during the conduct of the research may pose unintentional influence of coercion to participants. However, all the studies were believed to be conducted according to ethical protocols of seeking consent from participants to minimize the possibility of undue influence.

Recommendations for Future Studies

While the results are interesting, more research on assessing EP in diverse learning contexts and samples should be conducted. Comparative studies of EP in inquiry and non-inquiry learning contexts are recommended to ascertain the differences of learners' experience of emotions, if any, in these study contexts. Moreover, as this research calls for EP to be considered as a part of the CoI framework, a study to show EP as a separate construct from the three CoI presences is needed, and preferably in the Western higher education contexts as most of the past CoI research was conducted in these environments. Causal relationship models between the four presences in the CoI framework and other learning variables should be analyzed using SEM, for instance. Causal models, if any,

would be a useful theoretical tool in describing how learning happens at the intersection of the four presences.

One other interesting area that can be explored is integrating EP elements in existing ID models. As most ID models are designed to develop cognitive-oriented instruction, very little elements were found to invoke or foster EP in teaching. Future research undertaken could integrate elements of EP in ID models to bring about attitudinal and emotional changes.

Study Two revealed that the change in emotional regulation was correlated to both CP and the main task outcome. Future research should assess this area, possibly by tracking the changes of emotional regulation strategies employed over time in a learning situation and in this way, how the use of certain emotional regulation strategies at different phases of the inquiry learning activity is associated with CP and task output can be explored.

Another area that needs further investigation is the lack of a relationship between the change of interest-curiosity with CP. Although participants generally perceived that the increase of interest-curiosity drove their pursuit of new knowledge, it did not contribute to higher acquisition of knowledge. Could it possibly be that high performers do not show high EP change compared to low performers? Further work is required to establish if this is in fact true.

As for Study Three, there are two areas that can be explored further, the first is the emerging theme of Study Three regarding emotional safety in online discussion. Although emotional safety is not a dimension of EP in this research, it is seemingly important because it could influence the knowledge construction in a CoI. Future research can ascertain whether the issue of emotional safety is limited to the OLE or is also a part of f2f or blended course learning experience. Also, exploration into the connection between

online anonymity and emotional safety in academic online discussion is required: what level of online anonymity can provide a good level of emotional safety for discussion to take place, yet not jeopardizing the productivity of discussion? It is recommended that more study be conducted in this area.

Concluding Remarks

This research constitutes a preliminary step toward a more systematic study of EP and its relationships with three CoI presences. By analyzing the concept of EP and its effects, this research has shown how EP can be a crucial construct in sustaining and fostering epistemic engagement of inquiry learning in higher education. This research was able to identify the influence of EP and its changes on CP, further supporting the work conducted by clinical researchers on the interdependence between emotion and cognition. Although it is hypothetical at this point, the existence of a strong relationship between EP and CP might be concerned with the functional connectivity of the human brain between emotion and cognition, as found in clinical research (Dolcos et al., 2011; Lee et al., 2014). In the researcher's opinion, there might exist studies from different fields that point to similar findings on the interdependency between the affective and cognitive domains. It is to be hoped that more and more findings emerge over time. Nevertheless, this research has taken the first step to demonstrate the existence of such a relationship, which in itself is an important discovery.

Moreover, the research resonates with past studies that the CoI framework is evolving; meaning the revised model presented in this study is almost certainly not final and may not suffice. More 'presences' might be unveiled owing to the complexity of the nature of educational experience which could possibly involve other interactive constructs. Subsequent work, such as exploring the influence of extraneous variables on the intensity and interdependency of EP with other learning variables, will hopefully add to the

understanding of the affective learning experience. Finally, it is the utmost wish of the researcher that the ambiguities about the interdependence of both affective and cognitive domains should no longer persist.

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Appendices

Appendix A: Abbreviations

AEQ	Achievement Emotions Questionnaire
ARCS	Attention, Relevance, Confidence, Satisfaction
BS	Barlett's test of sphericity
CES	Classroom Emotions Scale
CFA	confirmatory factor analysis
CFI	Comparative Fit Index
CMRT	Cognitive-Motivational-Relational theory
CoI	community of inquiry
CP	cognitive presence
EFA	exploratory factor analysis
EMSQ	Emotion and Motivation Self-Regulation Questionnaire
EP	emotional presence
EPS	Emotional Presence Scale
f2f	face-to-face
ID	instructional design
IFI	Incremental Fit Index
KMO	Kaiser-Meyer-Olkin
LMS	learning management system
ML	maximum likelihood
OLE	online learning environment
PFC	prefrontal cortex
RMSEA	root mean square error approximation

SEM	structural equation modeling
SP	social presence
SPSS	Statistical Package for Social Sciences
TES-HOPE	Test Emotion Scale (Hope)
TLI	Tucker-Lewis Index
TP	teaching presence

Appendix B: Questions for Semi-Structured Interview (Study One)

Warm-up: Greetings, introducing myself, making small talk.

Think about a recent university course that you had attended. Please take some time to reflect on your experience of emotions in the process of learning throughout the course period.

1. Can you please share about your experience of emotions in relation to learning of this course?
2. Did you experience any positive emotions in the learning process? If yes, please describe the experience(s) in detail.
3. Did you experience any negative emotions in the learning process? If yes, please describe the experience(s) in detail.
4. When you experienced the (emotion(s) above), did you express it to your teacher or peers, or anyone else? Why?
5. Did you find yourself managing the (emotion(s) above) along the learning process? If yes, please explain in detail how you did it.
6. Were you aware of your experience of emotions during the learning process? How often did you find yourself reflecting on the emotion while experiencing it?

Is there anything else you would like to say?

This is the end of the interview. Thank you very much

Appendix C: 感情に関する調査

一番最近受講し終えた・もう少しで終わる授業科目を 1 つ思い浮かべてください。

その授業科目名を記入ください: _____

感情を表す用語

本アンケートにおける単語の定義を理解していただく為に、以下の説明をよく読んで単語の意味を確認してください。

それぞれの単語の定義を読み理解したら、**右欄にチェックマークをつけてください。**

感情	**意義**	*読んで理解したらチェックをつけてください*
興味・関心・好奇心	何かに惹かれる気持ち。また、詮索したくなったり、しきりに何かを知りたいと感じる気持ち	
戸惑い	なにかが心に引っかかる不確かな気持ち。また、手段や方法がわからなくてどうしたら良いか迷うこと。	
不安	緊張感で不快であったり、不明確な結果に対して気がかりや心配に思う気持ち	
希望	これから起こることに対して、よい結果を得られる自信や確信があるという気持ち	

［*めくる*］

本アンケートを始める前に、先程記入した科目・授業での経験を思い返してください。

その科目・授業における感情に関する以下の文章を読んで、それぞれの問いについてどの程度あなたが当てはまるか教えてください。<u>できるだけ率直にお答えください</u>。

1. 私はその授業の内容について話し合うことに興味を持った。

1	2	3	4	5
そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う

2. 私はその授業で新しい知識を得ることに興味を持った。

1	2	3	4	5
そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う

3. 私はその授業で自分の感情(興味、戸惑い、好奇心、不安等)を意識していた。

1	2	3	4	5
そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う

4. 学習時、自分の感情(興味、戸惑い、好奇心、不安等)の変化に敏感だった。

1	2	3	4	5
そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う

5. 私は自分で新しい知識に関するさらなる情報を調べることに興味を持った。

1	2	3	4	5
そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う

6. 授業内容は自分が過去経験したことに関連していた。

1	2	3	4	5
そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う

7. 私はその授業に関連する問題などを解決する時に戸惑いを感じたことがあった。

1	2	3	4	5
そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う

8. 私はその授業で新しいことを学ぶことに不安を覚えていた。

1	2	3	4	5
そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う

9. 私はその授業で先生が質問する度に不安を感じた。

1 2 3 4 5
そう思わない 少しそう思う どちらかといえばそう思う かなりそう思う 非常にそう思う

10. 私はその授業で何らかの難しさに直面したとき、うまく対処できるという自信があった。

1 2 3 4 5
そう思わない 少しそう思う どちらかといえばそう思う かなりそう思う 非常にそう思う

11. 私はその授業で抱いた感情(興味、戸惑い、好奇心、不安等)の原因がわかっていた。

1 2 3 4 5
そう思わない 少しそう思う どちらかといえばそう思う かなりそう思う 非常にそう思う

12. 私はその授業の中で他の人が感情を表現するとき、それを敏感に感じ取った。

1 2 3 4 5
そう思わない 少しそう思う どちらかといえばそう思う かなりそう思う 非常にそう思う

13. 私はその授業で提起された質問に対する答えを探すことに関心を持っていた。

1 2 3 4 5
そう思わない 少しそう思う どちらかといえばそう思う かなりそう思う 非常にそう思う

14. 私はその授業内容を理解するのに戸惑いを感じたことがあった。

1 2 3 4 5
そう思わない 少しそう思う どちらかといえばそう思う かなりそう思う 非常にそう思う

15. 私はその授業に相応しい感情表現の仕方を知っていた。

1 2 3 4 5
そう思わない 少しそう思う どちらかといえばそう思う かなりそう思う 非常にそう思う

16. 私は自分が実際に感じたことを他の人へ素直に表現していた。

1 2 3 4 5
そう思わない 少しそう思う どちらかといえばそう思う かなりそう思う 非常にそう思う

17. 私は自分のアイデアを他の人と共有することに不安を感じた。

1 2 3 4 5
そう思わない 少しそう思う どちらかといえばそう思う かなりそう思う 非常にそう思う

18. 私はその授業で新しい知識について戸惑いを感じたことがあった。

1 2 3 4 5

そう思わない　少しそう思う　どちらかといえばそう思う　かなりそう思う　非常にそう思う

19. 私は普段自分の感情について簡潔に説明ができる。

1 2 3 4 5

そう思わない　少しそう思う　どちらかといえばそう思う　かなりそう思う　非常にそう思う

20. 私はその授業で自分の負の感情をコントロールすることができていた。

1 2 3 4 5

そう思わない　少しそう思う　どちらかといえばそう思う　かなりそう思う　非常にそう思う

21. 私は自分の感情を学習環境に適切な方法で表現していた。

1 2 3 4 5

そう思わない　少しそう思う　どちらかといえばそう思う　かなりそう思う　非常にそう思う

22. 私はその授業内容をマスター出来るという自信があった。

1 2 3 4 5

そう思わない　少しそう思う　どちらかといえばそう思う　かなりそう思う　非常にそう思う

23. 私はその授業で教えられたこと以上のことを知ることに興味を持っていた。

1 2 3 4 5

そう思わない　少しそう思う　どちらかといえばそう思う　かなりそう思う　非常にそう思う

24. 私はその授業で良い成績をとる自信があった。

1 2 3 4 5

そう思わない　少しそう思う　どちらかといえばそう思う　かなりそう思う　非常にそう思う

25. 私はその授業で自分の感情を表現する方法をコントロールすることができていた。

1 2 3 4 5

そう思わない　少しそう思う　どちらかといえばそう思う　かなりそう思う　非常にそう思う

26. 私はその授業内容をちゃんと理解しているか不安だった。

1 2 3 4 5

そう思わない　少しそう思う　どちらかといえばそう思う　かなりそう思う　非常にそう思う

以下の質問は、あなたの学習中、どう感情をコントロールしているかのものです。

27. 学習において私が負の感情（例：不安、戸惑いなど）を経験する時、

	そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う
i. 身近な人と共有する。	1	2	3	4	5
ii. 悪い経験を自分のせいにしない。	1	2	3	4	5
iii. 悪い経験を他の人のせいにしない。	1	2	3	4	5
iv. この状況から学べる良い点について考える。	1	2	3	4	5
v. 自分の学び方を改善するためのプランを建てる。	1	2	3	4	5
vi. その悪い経験を繰り返し考えない。	1	2	3	4	5
vii. 他の活動をすることで自身の気を紛らわす。	1	2	3	4	5
viii. 周りの人の助けを求める。	1	2	3	4	5
ix. 疑念を解決するためにさらなる情報を集める。	1	2	3	4	5
x. あきらめようと思わない。	1	2	3	4	5

28. 学習において私が正の感情（例：興味、好奇心、希望など）を経験する時、

	そう思わない	少しそう思う	どちらかといえばそう思う	かなりそう思う	非常にそう思う
i. 表情（例：笑顔）を使って気持ちを表現する。	1	2	3	4	5
ii. 空き時間に授業内容に関する追加資料などを読む。	1	2	3	4	5
iii. 良い学習経験に対して、自分自身を褒める。	1	2	3	4	5
iv. 学習した内容について熱心に他の人に話す。	1	2	3	4	5
v. 授業においてよりポジティブな経験ができることを期待する。	1	2	3	4	5

Appendix D: Initial Items of Emotional Presence Scale for Empirical Testing

Items
Epistemic Emotive Experience
1 I was interested in engaging in discussions about the material.
2 I was interested in acquiring new knowledge in this course.
3 I was curious to search for more information about the new knowledge.
4 I was curious to find the answers to the questions posed in this course.
5 I was curious to know beyond what was taught in the class.
6 I experienced confusion in solving problems related to the course content.
7 I experienced confusion in understanding the material.
8 I was confused with new knowledge in this course.
9 I felt anxious about studying new things in this course.
10 I felt anxious whenever the teacher asked a question in this class.
11 I felt anxious to share my ideas with others.
12 I was worried about whether I had properly understood the material.
13 I was confident that I could cope well with the difficulties in this course.
14 I was confident that I would be able to master the material.
15 I was confident that I could achieve good grade in this course.
16 The course content was somehow related to my past experience.
Emotional Awareness
17 I was aware of my emotions (interest, confusion, curiosity, anxiety etc) when studying.
18 I was sensitive to the changes of my emotions (interest, confusion, curiosity, anxiety, etc) when studying.
19 I knew the reasons I felt the way I did.
20 I was aware of others' expression of emotions in this course.
21 In general, I could describe my emotions easily.
Emotional Expression
22 I knew the appropriate ways of expressing emotions in this learning environment.
23 I expressed my emotions to others as how I truly felt.
24 I could manage my negative emotions in this course.
25 I expressed my emotions in ways that were appropriate to the learning environment.
26 I was able to control the way I expressed my emotions.
Emotional Regulation
When I experience negative emotions (eg., anxiety, confusion) in study,
27 I share to people who are close to me.
28 I do not blame myself for the bad experience.
29 I do not blame others for the bad experience.
30 I think about the positive things I could learn from the situation.
31 I work out a plan to improve my learning strategies.
32 I do not keep thinking about the bad experience.
33 I distract myself by doing other activities.

34 I seek help from others.

35 I look up for more information to clarify my doubts.

36 I do not think of giving up.

When I experience positive emotions (eg., interest & curiosity, hope) in study,

37 I express my feelings through facial expressions (eg. smile, laugher etc.)

38 I spend time reading up more about the material on my own leisure time.

39 I find ways to reward myself for the good learning experience.

40 I eagerly share with others about what I learnt.

41 I anticipate more positive things ahead in this course.

Appendix E: Emotional Presence Scale (developmental phase)

Think of one MOST RECENT COURSE you have almost completed/ just completed in your university this year.

Please write down the name of that course (subject):

_____

Glossary of Emotions

It is important that you understand the concepts of emotions defined in this questionnaire.

Please spend a few minutes reading carefully the definition of emotions below.

After you have read and understood each definition, **please tick the box beside it.**

Emotion	**Definition**	***Please tick (✓) here after you have read and understood each definition***
Interest and Curiosity	the feeling of being attracted to something or having an eager urge to know more about something	
Confusion	the feeling of being unclear in the mind about something, having doubts or being uncertain over something	
Anxiety	the uncomfortable feeling of nervousness, worry or unease about something with an uncertain outcome	
Hope	the confident feeling of positive outcomes in the future	

[*Turn Over*]

Please tell us how much you agree to the following statements regarding your experience of emotions in this course. Please be candid with your answer.

1. I was interested in engaging in discussions about the material.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

2. I was interested in acquiring new knowledge in this course.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

3. I was aware of my emotions (interest, confusion, anxiety, curiosity etc) when studying.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

4. I was sensitive to the changes of my emotions (interest, confusion, anxiety, curiosity etc) when studying.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

5. I was curious to search for more information about the new knowledge.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

6. The course content was somehow related to my past experience.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

7. I experienced confusion in solving problems related to the course content.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

8. I felt anxious about studying new things in this course.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

9. I felt anxious whenever the teacher asked a question in this class.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

10. I was confident that I could cope well with the difficulties in this course.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

11. I knew the reasons I felt the way I did.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

12. I was aware of others' expression of emotions in this course.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

13. I was curious to find the answers to the questions posed in this course.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

14. I experienced confusion in understanding the material.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

15. I knew the appropriate ways of expressing emotions in this learning environment.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

16. I expressed my emotions to others as how I truly felt.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

17. I felt anxious to share my ideas with others.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

18. I was confused with new knowledge in this course.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

19. In general, I could describe my emotions easily.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

20. I could manage my negative emotions in this course.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

21. I expressed my emotions in ways that were appropriate to the learning environment.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

22. I was confident that I would be able to master the material.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

23. I was curious to know beyond what was taught in the class.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

24. I was confident that I could achieve good grade in this course.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

25. I was able to control the way I expressed my emotions.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

26. I was worried about whether I had properly understood the material.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

The following questions are about the way you manage your emotions during study, in general.

27. When I experience NEGATIVE emotions (eg., anxiety, confusion) in study,

	Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree
i. I share to people who are close to me.	1	2	3	4	5
ii. I do not blame myself for the bad experience.	1	2	3	4	5
iii. I do not blame others for the bad experience.	1	2	3	4	5
iv. I think about the positive things I could learn from the situation.	1	2	3	4	5
v. I work out a plan to improve my learning strategies.	1	2	3	4	5
vi. I do not keep thinking about the bad experience.	1	2	3	4	5
vii. I distract myself by doing other activities.	1	2	3	4	5
viii. I seek help from others.	1	2	3	4	5
ix. I look up for more information to clarify my doubts	1	2	3	4	5
x. I do not think of giving up.					

28. When I experience POSITIVE emotions (eg., interest & curiosity, hope) in study,

	Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree
i. I express my feelings through facial expressions (eg. smile, laugher etc.)	1	2	3	4	5
ii. I spend time reading up more about the material on my own leisure time.	1	2	3	4	5
iii. I find ways to reward myself for the good learning experience.	1	2	3	4	5
iv. I eagerly share with others about what I learnt.	1	2	3	4	5
v. I anticipate more positive things ahead in this course.	1	2	3	4	5

Appendix F: Test Emotions Scale (Hope)

The questions below refer to emotion you may experience when taking tests or exams. Before answering the questions below, please recall some typical situations of test-takings or exams which you have experienced during the recent course indicated above.

1. I am quite confident that my preparation will be sufficient.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

2. I am optimistic that everything will work out fine.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

3. I am very confident.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

4. I have great hope that my ability will be sufficient.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

5. I think about my exam optimistically.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

6. I start studying for the exam with great hope and anticipation.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

7. My confidence motivates me to prepare well.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

8. Hoping for success, I’m motivated to invest a lot of effort.

1	2	3	4	5
Do not agree	Slightly agree	Somehow agree	Agree	Strongly agree

Appendix G: Research Ethics Committee Approval for the Conduct of Study

Notification of Investigation Results

Date: 10/15/2019

To (Applicant): Prof. Insung Jung
From: President, International Christian University

Document No.: 2019-31
Name of Research Project: The Role, Value, and Dynamic of Emotional Presence in Learning
Individual Responsible for Research: Siaw Eng Tan

I herewith notify you of the following results of the Research Ethics Committee's investigation of the above named research project.

1. Decision: ■ Approved ☐ Conditional approval ☐ Changes recommended ☐ Rejected ☐ Not applicable
2. Reason: N/A
3. Remarks: N/A

※ If changes are recommended, investigation request must be resubmitted.

Signature:

Appendix H: Emotional Presence Scale

	Strongly Agree	Disagree	Neutral	Agree	Strongly Agree
1. I was interested in engaging in discussions about the material.	1	2	3	4	5
2. I was curious to search for more information about the new knowledge.	1	2	3	4	5
3. I was curious to know beyond what was taught in the class.	1	2	3	4	5
4. I was aware of my emotions (interest, confusion, curiosity, anxiety, etc) when studying.	1	2	3	4	5
5. I was sensitive to the changes of my emotions (interest, confusion, anxiety, curiosity, etc) studying.	1	2	3	4	5
6. I knew the reasons I felt the way I did.	1	2	3	4	5
7. I was aware of others' expression of emotions in this course.	1	2	3	4	5
8. I knew the appropriate ways of expressing emotions in this learning environment.	1	2	3	4	5
9. I expressed my emotions in ways that are appropriate to the learning environment.	1	2	3	4	5
10. I was able to control the way I expressed my emotions.	1	2	3	4	5
11. I could manage my negative emotions in this course.	1	2	3	4	5

Questions 12 and 13 are about the ways you manage your emotions in study.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
12. When I experienced NEGATIVE emotions (e.g., anxiety, confusion) in study,					
i. I thought about the positive things I could learn from the situation.	1	2	3	4	5
ii. I worked out a plan to improve my learning strategies.	1	2	3	4	5
iii. I looked up for more information to clarify my doubts.	1	2	3	4	5
iv. I did not think of giving up.	1	2	3	4	5
13. When I experience POSITIVE emotions (e.g., interest & curiosity, hope) in study, I eagerly shared with others about what I learnt.	1	2	3	4	5

Appendix I: Community of Inquiry Survey

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Social Presence					
1. Getting to know other course participants gave me a sense of belonging in the course.	1	2	3	4	5
2. I was able to form distinct impressions of some course participants.	1	2	3	4	5
3. Online or web-based communication is an excellent medium for social interaction.	1	2	3	4	5
4. I felt comfortable conversing through the online medium.	1	2	3	4	5
5. I felt comfortable participating in the course discussions.	1	2	3	4	5
6. I felt comfortable interacting with other course participants.	1	2	3	4	5
7. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	1	2	3	4	5
8. I felt that my point of view was acknowledged by other course participants.	1	2	3	4	5
9. Discussions helped me to develop a sense of collaboration.	1	2	3	4	5
Cognitive Presence					
10. Problem posed increased my interest in the course issues.	1	2	3	4	5
11. Course activities piqued my curiosity.	1	2	3	4	5
12. I felt motivated to explore content-related questions.	1	2	3	4	5
13. I utilized a variety of information sources to explore problems posed in this course.	1	2	3	4	5
14. Brainstorming and finding relevant information helped me resolve content related questions.	1	2	3	4	5
15. Discussions were valuable in helping me appreciate different perspectives.	1	2	3	4	5

16. Combining new information helped me answer questions raised in course activities.	1	2	3	4	5
17. Learning activities helped me construct explanations or solutions.	1	2	3	4	5
18. Reflection on course content and discussions helped me understand fundamental concepts in this class.	1	2	3	4	5
19. I could describe ways to test and apply the knowledge created in this course.	1	2	3	4	5
20. I have developed solutions to course problems that could be applied in practice.	1	2	3	4	5
21. I could apply the knowledge created in this course to my work or other non-class related activities.	1	2	3	4	5
Teaching Presence					
22. The instructor clearly communicated important course topics.	1	2	3	4	5
23. The instructor clearly communicated important course goals.	1	2	3	4	5
24. The instructor provided clear instructions on how to participate in course learning activities.	1	2	3	4	5
25. The instructor clearly communicated important due dates/time frames for learning activities.	1	2	3	4	5
26. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	1	2	3	4	5
27. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.	1	2	3	4	5
28. The instructor helped to keep course participants engaged and participating in productive dialogue.	1	2	3	4	5
29. The instructor helped keep the course participants on task in a way that helped me to learn.	1	2	3	4	5
30. The instructor encouraged course participants to explore new concepts in this course.	1	2	3	4	5
31. Instructor’s actions reinforced the development of a sense of community among course participants.	1	2	3	4	5

32. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	1	2	3	4	5
33. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.	1	2	3	4	5
34. The instructor provided feedback in a timely fashion.	1	2	3	4	5

Appendix J: Emotion Record Sheet

Course : EDU203 Instructional Design and Technology (Autumn 2019 term)
Learning activity: Microteaching II

Microteaching Group: Date:

Please write down **any experience of emotions** in sentence, words or phrases (e.g., excited, curious, nervous, confused, worry, stressed, hopeful, enjoyment, interested…..) in the microteaching activity from Week 7 to Week 9.

1. Planning: (Week _____) meeting group members for the first time, select ID model etc.

2. Exploration: (Week_____) exploring the topic (gamification/ blended learning), understanding the topic, setting scope of lesson to be taught, finding resources etc.

3. Development: (Week _____) integrate ID model into lesson plan, developing materials etc.

4. Teaching & Evaluation: (Week 9) teaching the lesson, being taught, and reviewing your microteaching video with a group partner etc.

Appendix K: Questions for Focus Group Interview (Study Two)

Warm-up: Greetings, introducing myself, making small talk.

(Brief explanation about the conduct of the interview)

Please take some time to reflect on your experience in microteaching activity.

General Experience, Emotive Experience, Emotional Regulation

1. Can you please share about your group's experience in preparing for the microteaching activity?
2. Which ID model did your group use in this activity? Can you please share why your group decided on this ID model to teach the lesson?
3. Which phase of the microteaching activity was most easy? Which phase was most difficult? Why?
4. Please share any positive experience of emotions that you all as a group experienced in the microteaching activity. How did you all respond to this situation/experience?
5. Please share any negative experience of emotions that you all as a group experienced in the microteaching activity. How did you all respond to this situation/experience?

Emotional Awareness

1. During which phase of the microteaching activity were you most aware of your emotions? Why?
2. What did you do about that situation? Why?

Expression Management

1. Can you please describe the changes in the way you express your emotions, if any, from Week 7 to Week 9? Expressing emotions refers to feeling comfortable to show your actual feelings to your team.
2. How often did you feel the need to express emotions in a way acceptable among your peers? Why do you feel the need to do so? If it is fine, can you share an experience?

Is there anything else you would like to say?
This is the end of the interview. Thank you very much.

Appendix L: Coding Schemes of Content Analysis

Coding scheme for *teaching presence* (adapted from Shea, Hayes, & Vickers, 2010)

Categories	Indicators	Code	Definition
Design and organization (DE)	Setting curriculum and communicating assessment methods to be used in the course	DE1	Communicates important course outcomes, e.g., documentation of course goals, topics, rubrics, and instructor expectations
	Designing methods	DE2	Provides clear instructions how to participate in course learning activities, e.g., clear explanation of how to complete course assignments successfully.
	Establishing time parameters	DE3	Communicates important due dates/time frames for learning activities to help students keep pace with the course, e.g., accurate course schedule
	Utilizing medium effectively	DE4	Assists students to take advantage of the online environment to enhance learning, e.g., using LMS features for learning activities and resolving technical problems
	Establishing etiquette/netiquette	DE5	Helps students understand and practice the kinds of behaviours that are acceptable in f2f/online learning, e.g., providing documentation on polite forms of f2f/online interaction
	Making macro-level comments about course content	DE6	Provides rationale for assignment/topic
Facilitating discourse (FD)	Identifying areas of agreement/disagreement	FD1	Helps to identify areas of agreement and disagreement on course topics in order to enhance student learning
	Seeking to reach consensus	FD2	Assists in guiding class toward agreement about course topics in a way to enhance student learning
	Encouraging, acknowledging, or reinforcing student contributions	FD3	Acknowledges student participation in the course, e.g., replied in a positive encouraging manner to student submissions
	Setting climate for learning	FD4	Encourages students to explore concepts in the course, e.g., promotes the exploration of new ideas
	Drawing in participants, prompting discussion	FD5	Helps keep students engaged and participating in productive dialog
	Presenting follow-up topics for discussions (ad hoc)	FD6	Presents content or questions, i.e., tangential or related
	Re-focusing discussion on specific issues	FD7	Helps focus discussion on relevant issues Keeps participants on topic
	Summarizing discussion	FD8	Reviews and summarizes discussion contributions to highlight key concepts and relationships to further facilitate discourse
Direct instruction (DI)	Providing valuable analogies	DI1	Attempts to rephrase/reformulate course material in ways that highlight similarities between content assumed to be understood and new content with the goal of making the material more comprehensible

	Offering useful illustrations	DI2	Attempts to make course content more comprehensible by providing examples that are substantive and advance understanding
	Conducting supportive demonstrations	DI3	Attempts to make course content more comprehensible through the exhibition of processes
	Supplying clarifying information	DI4	Attempts to reduce confusion or misconceptions about course content by providing additional explanations
	Making explicit reference to outside material	DI5	Provides useful information from a variety of sources, e.g., articles, textbooks, personal experiences, or links to external websites
	Giving formative feedback for discussions	D16	Explicitly evaluates discussion/offers feedback

Coding scheme for *social presence* (adopted from Shea, Hayes, Vickers, Gozza-Cohen, et al., 2010)

Categories	**Indicators**	**Code**	**Definition**
Affective (AF)	Expressing emotions	AF1	Conventional expressions of emotion
	Use of humor	AF2	Teasing, cajoling, irony, understatements, sarcasm
	Self disclosure	AF3	Presents details of life outside of class, or expresses vulnerability; includeds expressions of likes, dislikes, and preferences
	Use of unconventional expressions to express emotion	AF4	Unconventional expressions of emotion, includes repetitious punctuation, conspicuous capitalization, emoticons
	Expressing value	AF5	Expressing personal values, beliefs, and attitudes
Open communication	Continuing a thread	OC1	Using reply feature of software, rather than starting a new thread
	Quoting from others' messages	OC2	Using software features to quote others' posts
	Referring explicitly to others' messages	OC3	Direct references to contents of others' posts
	Asking questions	OC4	Students ask questions of other students or the moderator
	Complimenting, expressing appreciation	OC5	Complimenting others or contents of others' messages
	Expressing agreement	OC6	Expressing agreement with others or contents of others' messages
	Expressing disagreement	OC7	Expressing disagreement with other or contents of others' messages
	Personal advice	OC8	Offering specific advice to classmates
Group cohesion (CH)	Vocatives	CH1	Addressing or referring to the participants by name
	Addresses or refers to the group using inclusive pronouns	CH2	Addresses the group as we, us, our group
	Phatics, salutations and greetings	CH3	Communication that serves a purely social function; greetings or closures
	Social sharing	CH4	Sharing information unrelated to the course
	Course reflection	CH5	Reflection on the course itself

Coding scheme for *cognitive presence* (adopted from Shea, Hayes, Vickers, Gozza-Cohen, et al., 2010

Categories	**Indicators**	**Code**	**Definition**
Triggering event	Recognize problem	TE1	Presenting background information that may culminate in a question or presents a problem/ issue
	Sense of puzzlement	TE2	Asking questions or messages that take discussion in a new direction
Exploration	Exploration within the online community	EX1	Unsubstantiated agreement or disagreement/contradiction of previous ideas
	Exploration within a single message	EX2	Many different ideas/themes presented in one message (use even if prompt requires pro/con instructions)
	Information exchange	EX3	Personal narratives or description (not necessarily regarding personal experiences) or facts. Add points but does not systematically defend/justify/develop solution
	Suggestions for consideration	EX4	Author explicitly characterizes message as exploration
	Leaps to conclusions	EX5	Offers unsupported opinions
Integration	Integration among group members	IN1	Reference to previous message followed by substantiated agreement or disagreement. Building on, adding others' ideas
	Integration within a single message	IN2	Justified, developed, defensible, yet tentative hypotheses
	Connecting ideas, synthesis	IN3	Integrating information from one or more sources - textbook, articles, personal experience, other posts or peer contributions
	Creating solutions	IN4	Explicit chracterization of message as a solution by participant
Resolution/ Application	Vicarious application to real world testing solutions	RE1	Providing examples of how problems were solved
	Defending solutions	RE2	Defending why a problem was solved in a specific manner

Appendix M: Questions for Semi-Structured Interview (Study Three)

Warm-up: Greetings, introducing myself, making small talk

(Brief explanation about the conduct of the interview)

Basic Questions

1. Overall, what do you think of watching the two films, and getting on the online discussion forum on Moodle to discuss it with your friends and teacher?

2. Did you feel this is a task to complete, or you did not care to just barely meet the minimum number of posts set by the teacher?

3. How was the relationship between you and other group members? Do you know them personally, or they are strangers to you?

4. Was your interaction mainly due to the forum, or it went beyond this forum?

Emotive Experience and Emotional Regulation

5. Were there any positive feelings/emotions that you experienced while participating in this forum? Please explain. What made you feel positive about it? Did you do anything about this positive feeling?

6. Were there any negative feelings/emotions that you experienced while participating in this forum? Please explain. How did you cope with these negative feelings? Did you do something about it?

7. What affects your emotions most in this forum: The content of discussion, the teacher's comments, or the group members' discussion, or any other things? Why?

Emotional Awareness

8. Were you aware of your own emotions while participating in this activity? Why?

9. Were you able to feel others' expression of emotions? How and why?

Expression Management

10. Were you comfortable to express your feelings (even to disagree with others' opinions) on the discussion forum? Why?
11. Were you comfortable to disagree with someone in the forum, including your teacher?
12. Were you comfortable to be disagreed by someone in the forum?

Others

13. Do you think this forum is useful to help you in understanding about the course even better? In which way (if yes)?

14. Is there anything else that you would like to say?

Appendix N-1: Online Discussion Transcript (Excerpt 1)

Student 1 (started a discussion about shapes of objects as the main topic)

I would say the implied dials or other objects are one of the most important in the films. Because both of the films had focused on the dial based on the title, although I felt Dial M focused more, and it could show us some suggestion through the objects or some shapes. That could make the audience feel not only think more in the action. For example, as for the Dial M, in addition to the dials, there were a lot of lamps in the scene as we discussed in the class before. Just because the lamp on each scene, I felt like there is a light for the ending which I would say happy ending. On the other hand, in A Perfect Murder, there were many using of triangles, in the scenes which Steven, David and Emily were on. The angle made me feel more fear or nervousness, and I found out that in Dial M, there are less triangle than APM, even when the three casts are in the same scene, they were not tend to be standing making triangle in DM.

Student 2 (replied to the thread but focused solely on a murder plan)

Seeing how the story went very complicated in APM, I thought to create a perfect murder, only the person themselves should know the secret.In APM Steven asks David to kill Emily, but David hired another man to execute the plan. At this moment, three people are involved in this murder. The hired man was dead, so there is only David who knows everything. But David was the unexpected character that made Steven's situation complicated and difficult to hide the murder. In DMM, Tony and Swan were the only two who knows the plan, and Swan was dead, so it was slightly easier for him to hide the murder. I heard the news before that a murder plan failed because of having too much subcontracting. I thought to create a perfect murder, the person should not ask somebody else to do it.

Student 3 (replied to the thread but speculated on alternative endings)

Since I watch a Youtube channel how it should have ended, which is a channel that animates different ways a movie should have ended, I started to think how APM and DMM could have gone done if a character did a certain thing. The most of thought of this is with the character of Margot and Emily. I wonder what would have happened if both characters would have told the truth a lot more earlier or as soon as they fell in love with someone else. I always wonder if Tony and Steven partly wanted to kill Margot and Emily because they lied. I'm sure that there (their)pride and jealousy played a big part in their attention (intentions). But what would had happened if Margot and Emily told them earlier and they didn't figure out themselves. Would Tony and Steven have forgave them or would the movie still play out the same way

Appendix N-2: Online Discussion Transcript (Excerpt 2)

Student 1 (discussed repetitive scenes of Film 2, *A Perfect Murder*)

I had an issue with how Emily was portrayed. It seems that the only truly sin worthy thing that she did was to cheat on her husband. With everything else that happens to her, she seems to be the victim, or at least not as guilty as she is a victim. Husband is controlling-victim. Lover is a criminal-victim. Almost gets killed-victim. Gets attacked by husband-victim. Adding on to this, the fact that she killed her husband when she could have called the cops, resulting in a more peaceful solution, seems to be forgiven in the film. In the last scene, the detective looms over her as a higher authority and gives her some sort of blessing. Is he forgiving her for killing someone when there were more peaceful solutions?

Student 2 (showing agreement, giving short reply)

I agree with you. All Emily did was cheat on another guy, and it does not deserve death.

Student 3 (showing agreement, giving short reply)

I also agree with you. Although in the film Emily's husband is killed from wife's self defense, I half wished she had just gone to the police with all the evidence (ex: the tape) instead of confronting Steven.

Appendix N-3: Online Discussion Transcript (Excerpt 3)

Student 1 (discussing about weapons used in both films)

In Film DMM, the scissors were mentioned not so much, as some people could possibly miss the importance of it beforehand. On the other hand, the meat thermometer in APM was not mentioned directly, but we could see it for longer than the scissors. That is, the meat thermometer, which plays the same role as scissors, draws our attention more directly and obviously, and it's easier to predict it would be used as Emily's weapon. Furthermore, I found it interesting that we could see the kitchen several times in APM while there were few scenes in DMM. I suppose that the scene in APM was created assuming that the audience knows Emily wouldn't be killed at this point; therefore, the weapon meat thermometer was shown more visibly. Moreover, "grilled" chicken appeared on purpose because some characters were grilled by others; for instance, Stephen threatened David by disclosing his background.

Student 2 (expressing interest, integrating the topic but provides own opinion with supporting points)

I am interested in focusing on the weapons in the two movies. Especially, the meat thermometer was emphasized in APM. You mentioned that we could see the kitchen several times in APM. I think it was complicated to see the structure of the whole room gradually in DMM, but we could see the structure of the whole room clearly from the beginning of APM and this made us understand that the big event would happen in the kitchen emphasized in several times.

Student 3 (showing compliments, expresses vulnerability, integrating the topic by providing personal experience in film watching)

I think this is a pretty interesting observation because now that I think about it, I didn't really expect the scissors to be the murder weapon in DMM, but I knew the meat thermometer would be turned into some kind of weapon in APM the moment it was shown up close on the screen (however, this might just be because I already knew how the murder in DMM turned out). I guess this was a good way to foreshadow future events, but to me, it almost felt too obvious and didn't have the thrill that I had while watching DMM.