Reward Presence: Extending the Community of Inquiry Framework in Online Learning

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EDUCATION

by

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CERTIFICATE

This is to certify that the thesis **"Reward Presence: Extending the Community of Inquiry Framework in Online Learning"** submitted by **Ms. Runu Mani Das** bearing **Reg. No. 20SEMD04** in partial fulfilment of the requirements for award of Doctor of Philosophy in Education and Education Technology (DoEET) is a bonafide work carried out by her under my supervision and guidance.

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- **Das, R. M., & Madhusudan, J. V.** (2024). Analysing the Community of Inquiry Model in the Context of Online Learning: A Bibliometric Study. TechTrends
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Further, the student has passed the following courses towards fulfilment of coursework requirement for Ph.D.

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I dedicate this work to all the online learners who advocate for practical rewards in online learning. Your drive, curiosity, and commitment remind us that motivation is not just an idea but a powerful force that can shape meaningful educational experiences. If this work benefits your learning performance, then the researcher's purpose in undertaking this study will be truly justified.

Declaration

I, **Runu Mani Das**, hereby declare that this thesis entitled **"Reward Presence: Extending the Community of Inquiry Framework in Online Learning",** submitted by me under the guidance and supervision of **Prof. Madhusudan J.V.**, Head, Department of Education and Education Technology, School of Social Sciences, University of Hyderabad, is a bonafide research work. I also declare that it has not been submitted previously in part or in full to this University or any other University or Institution for the award of any degree or diploma. I hereby agree that my thesis can be deposited in Shodhganga/INFLIBNET.

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This thesis contributes to Sustainable Development Goal 4 (Quality Education) by strengthening the theoretical and empirical foundations of effective online learning environments. As digital education expands globally, ensuring quality, engagement, and meaningful learning experiences has become a critical priority. The Community of Inquiry (CoI) framework has been widely used to design and evaluate online learning; however, it does not explicitly address how motivational regulation influences student engagement and learning outcomes.

By introducing "reward presence" as a motivational regulator within the CoI framework, this study advances the understanding of how intrinsic and extrinsic motivation can be structured to enhance learner participation, persistence, and performance. Through qualitative and quantitative investigation involving higher education students, the research demonstrates that rewards such as feedback, recognition, badges, points, and instructor appreciation significantly enhance engagement. The findings further reveal that reward presence indirectly strengthens teaching presence, social presence, and cognitive presence, thereby improving the overall effectiveness of online learning environments.

This contribution supports SDG 4 by promoting evidence-based strategies to improve educational quality in digital contexts. By enhancing motivational regulation, the study provides practical insights for instructional designers, educators, and institutions to create more inclusive, engaging, and supportive online learning systems. Ultimately, integrating reward presence into established pedagogical frameworks can improve learner satisfaction, retention, and academic success, thereby advancing equitable access to high-quality education in higher education institutions worldwide.

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Thank you all

Runu Mani Das

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LIST OF ABBREVIATIONS

AM	Amotivation
AMOS	Analysis of Moment Structures
AVE	Average Variance Extracted
CoI	Community of Inquiry
CET	Cognitive Evaluation Theory
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
CP	Cognitive Presence
CR	Composite Reliability
DF	Degrees of Freedom
ECVI	Expected Cross-Validation Index
EFA	Exploratory Factor Analysis
ER	Extrinsic Reward
GFI	Goodness-of-Fit Index
IFI	Incremental Fit Index
LMS	Large Language Model
MOOCs	Massive Open Online Courses

NPTEL	National Programme on Technology Enhanced Learning
NFI	Normed Fit Index
PR	Performance Reward
PCLOSE	p-value for Test of Close Fit
RMSEA	Root Mean Square Error of Approximation
SDT	Self-Determination Theory
SEM	Structural Equation Modelling
SPSS	Special Packages for Social Sciences
SRMR	Standardised Root Mean Square Residual
SWAYAM	Study Webs of Active-Learning for Young Aspiring Minds
TLI	Tucker-Lewis Index
TP	Teaching Presence
SP	Social Presence

ABSTRACT

The community of inquiry framework is widely recognised as a foundational model for designing meaningful online learning environments and comprises three core presences: cognitive presence, teaching presence, and social presence. Subsequent research has proposed additional presences, including learning presence, emotional presence, and institutional presence, to account for learners' self-regulation, emotional engagement, and institutional support, thereby extending and strengthening the original framework. However, the core three presences along with the additional presences in the CoI do not explicitly address how extrinsic and intrinsic motivation are regulated in online learning. Therefore, the present study proposed to introduces "reward presence" as a motivational regulator and examines its role within the community of inquiry framework. The study was conducted in two phases. Phase I examined the role and importance of rewards in the online learning environment, while phase II measured reward presence within the community of inquiry framework. The participants consisted of higher education students who had completed at least one online course (Phase I: n = 20; Phase II: n = 722) from multiple institutions. Data were collected using semi-structured interview and Likert-scaled survey instrument. The data were analysed using thematic analysis in Phase I, and exploratory factor analysis, confirmatory factor analysis, and structural equation modelling in Phase II. The findings from phase I indicated that rewards play a significant role in enhancing learner engagement and participation. Participants reported that rewards linked to both extrinsic and intrinsic motivation, such as points, badges, leaderboards, constructive feedback, and instructor appreciation, can improve engagement and performance while addressing challenges in online learning. The findings from phase II showed that reward presence has an indirect influence on teaching presence, social presence, and cognitive presence, supporting its role as an additional presence within the CoI framework for regulating motivation. Hence, integrating reward presence in the CoI framework may enhance overall outcome of all the existing presences in the model.

Keywords: Community of Inquiry, Reward Presence, Motivational Regulation, Structural Equation Modelling

CHAPTER - I

INTRODUCTION

Chapter-I

Introduction

1.1 Introduction

Online learning has evolved through several stages, beginning with early internet-based distance education, advancing to the implementation and widespread use of learning management systems (LMS), and culminating in the rise of massive open online courses (MOOCs). In recent years, online education has become an integral and prominent way to learn, offering flexible, accessible, and personalised learning experiences. Globally, MOOCs and similar platforms now bring together courses from different universities and even work with employers, allowing learners to gain useful skills and certificates through affordable and easy-to-access subscription plans (Palvia et al., 2018; Salama & Hinton, 2023). Its widespread adoption across diverse educational contexts helps to understand its role as a transformative factor in global education, contributing to the redefinition of how knowledge is created, delivered, and experienced in the online learning environment.

Despite the rapid growth of online learning platforms, sustaining learners' motivation, engagement, and meaningful interaction remains a significant difficulty, often resulting in high attrition rates and declining participation (Chen & Jang, 2010; Miltiadou & Savenye, 2003). Research consistently highlights that motivation is the foundational element for creating effective and engaging online learning environments (Hartnett et al., 2011; Zeng et al., 2024). When learners lack sufficient motivation, their ability to persist and achieve meaningful outcomes decreases, leading to course dropouts and limited learning gains. Consequently, scholars have increasingly focused on developing motivationally rich learning environments and incorporating strategies such as gamification and reward systems to sustain engagement and improve learner retention (Hew et al., 2016; Li & Xu, 2024; Wang & Baker, 2015; Wüster et al., 2016).

Apart from incorporating motivational strategies in online learning, educators have introduced a range of theoretical models, conceptual frameworks, and theoretical paradigms to enhance the quality of online education and guide its effective implementation (Akyol et al., 2009; Hamilton et al., 2016). Among these, the most

prominent and widely adopted framework in the online learning space is the community of inquiry (CoI) model. Introduced at the beginning of the 21st century, the framework emerged as a foundational model in online higher education as a collaborative and constructivist model designed to explain and enhance the meaningful and sustained learning experience (Garrison et al., 2000). It emphasises the dynamic interaction among three fundamental components: teaching, social, and cognitive presence, that collectively foster meaningful learning through sustained communication and reflection. The CoI model has been progressively established itself as a foundational and empirically validated model within online education research, influencing both theoretical discourse and pedagogical practices designed to foster learner engagement, meaningful interaction, and deep learning.(Williams, 2017).

Over time, researchers have attempted to strengthen and expand the CoI framework by introducing additional presences that capture overlooked dimensions of the online learning experience. Learner presence, emotional presence, and institutional presence have been proposed to enrich the model and offer a more holistic understanding of online education (Cleveland-Innes & Campbell, 2012; Gedera et al., 2015; Shea et al., 2012; Zhang & Zhu, 2023). Learner presence, grounded in self-regulated learning theory (Zimmerman, 2000, 2008), represents learners' capacity to plan, monitor, and evaluate their learning processes, thereby strengthening cognitive engagement and academic performance within the CoI structure (Shea et al., 2012; Wertz, 2022). Emotional presence, on the other hand, highlights the role of emotions and emotional intelligence in learning interactions. Cleveland-Innes and Campbell (2012), Jiang and Koo (2020), and Majeski et al. (2018) highlight that 'emotional presence' extends beyond social interaction, encompassing how learners experience and regulate their emotions, which subsequently influences their engagement and sustained participation in online learning environments. Moreover, institutional presence extends the framework by emphasising the organisational and administrative support necessary to maintain a stable, effective online learning environment. It aligns with other presences to create structural conditions that enhance pedagogical and learner success (Zhang & Zhu, 2023).

Despite these extensions, the expanded framework still lacks a focused dimension that directly addresses the motivational mechanisms sustaining learners' engagement and persistence in online environments**.** While learner, emotional, and institutional presences have advanced the model conceptually, they do not explicitly capture how motivation,

particularly through reward-based reinforcement, can maintain and regulate learners' performance over time. Moreover, Garrison and Arbaugh (2007) emphasised the need for more quantitatively focused studies to identify moderators that could deepen the relationship between CoI components and course success (Shea et al., 2012). Addressing both theoretical and empirical gaps, the present study proposes the inclusion of reward presence as an additional presence, emphasising how reward-based motivational mechanisms may regulate and sustain engagement, thereby enriching the overall learning experience within the CoI framework.

Despite the valuable extensions made to the CoI framework through learner, emotional, and institutional presences, a critical gap remains concerning the sustained regulation of motivation in online learning. While these additional presences have enriched the model's understanding of engagement, emotions, and institutional support, they do not explicitly address how structured motivational mechanisms such as rewards can be designed to sustain learner effort and persistence across learning activities. This omission is particularly important because online learning environments often struggle with reduced motivation and engagement, which directly impacts completion rates and learning outcomes (Chen & Jang, 2010; Miltiadou & Savenye, 2003).

According to motivational perspective of self-determination theory (SDT), motivational need arises from individuals' necessity for autonomy, competence, and relatedness (Deci & Ryan, 1985; Deci & Ryan, 2000) is considered as the key to understand how learners initiate, regulate, and sustain engagement in online contexts. Integrating SDT with practical motivational strategies such as gamification and rewards provides an evidence-based approach to enhance learners' intrinsic and extrinsic motivation (Hamari et al., 2014; Sailer et al., 2017; Zainuddin et al., 2020). When thoughtfully designed, reward elements such as badges, performance points, progress cues, challenge tasks, and feedback mechanisms may address core psychological needs, thereby strengthen intrinsic motivation and foster sustained engagement.(Deci & Ryan, 1985; Deci & Ryan, 2000).

Therefore, this study argues that the CoI framework requires an explicit motivational dimension that incorporates reward-based mechanisms to strengthen all existing presences. When thoughtfully designed, structured reward and motivation strategies can reinforce teaching presence by offering timely feedback and clear learning

goals, enhance social presence through collaborative achievements and peer recognition, improve cognitive presence by sustaining curiosity and continuous effort in problem-solving, and support learning presence by fostering self-regulated motivation and persistence throughout the learning process.

From this perspective, the study introduces reward presence as a novel construct integrated into the CoI framework. Reward presence represents the perceived extent to which reward-based elements regulate and sustain learners' motivation in online environments. Introducing motivation (through rewards) into the framework in a measurable and practical way is the central effort of this study. By addressing the motivational regulation gap, which is defined as how rewards regulate and sustain learners' intrinsic and extrinsic motivation, reward presence seeks to complement and reinforce the interplay of the existing presences, thereby enriching the CoI framework both theoretically and empirically.

1.2 Significance of the Study

According to Bates (2018), despite over a hundred years of research on learning processes, the translation of the findings into instructional practice remains limited. Since the 20 years of the CoI framework have been developed, it is known as one of the most cited and influential models that has been focusing on providing meaningful learning experiences (Williams, 2017). Studies also addressed the need to expand the framework to provide practical experience to enhance learning. This includes the idea of metacognition (Garrison, 2022), emotional regulation (Cleveland-Innes & Campbell, 2012), learning presence (self-regulation) (Shea et al., 2012), institutional presence (infrastructure) (Zhang & Zhu, 2023), and others.

The history of motivation has been key to psychology since the early twentieth century, evolving from the learning theory of behaviourism to the concept of drive and need (Hull, 1943; Maslow, 1943) to contemporary perspectives emphasising intrinsic and extrinsic regulation (Deci et al., 1985). However, at the practical level, motivation has mostly been addressed from a theoretical perspective, and its systematic application in the learning process has received little attention so far. The CoI framework requires further refinement to align with the evolving understanding of learners' motivational needs.

Although the focus on motivation and gamification gained prominence after the COVID-19 pandemic, efforts to address learner motivation had already begun earlier, but were not taken seriously in practice. Although online learning has rapidly expanded due to its flexibility and adaptability, sustaining learner motivation remains a major challenge, contributing to high attrition and disengagement rates (Miltiadou & Savenye, 2003).

The study proposes to assess the role of rewards and reward-based learning within the CoI. It also aims to identify which reward elements, such as feedback, recognition, badges, points, and certificates, are most effective and adaptable in reward-based pedagogy. The key findings may offer useful insights for refining and positioning the CoI framework so that it remains a relevant and valuable model in the growing field of online learning.

1.3 Integrated Conceptual and Theoretical Framework

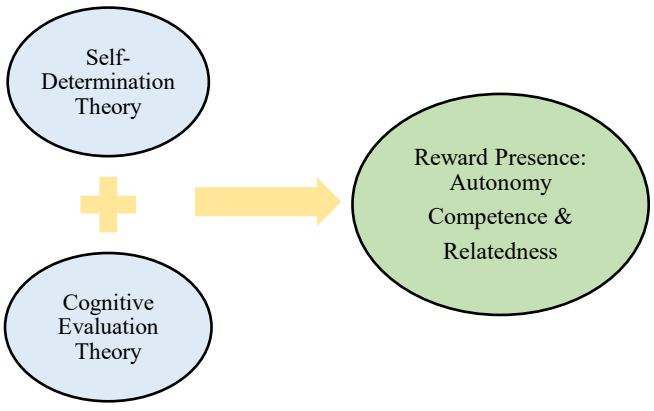
The idea of a "community of inquiry" finds its roots in the philosophical scholarship of Charles S. Peirce, who emphasised collaborative inquiry as a means of constructing knowledge and introduced the approach of scientific inquiry into philosophical discourse (Pardales & Girod, 2006). Peirce's ideas, later expanded through the Philosophy for children movement and adopted in social studies and sociocultural theory, emphasise a community of individuals who, through shared inquiry, develop a common understanding about the nature and justification of what is considered true (Pardales & Girod, 2006).

This study seeks to extend by introducing an additional presence that may enhance the CoI framework theoretically to provide meaningful online learning experiences (Garrison et al., 2000). The CoI framework views learning as a collaborative and constructive process that develops through community and inquiry within an educational setting (Swan et al., 2009). Rooted in constructivist theory, it posits that learners construct knowledge through interaction between their experiences and ideas. Drawing from Vygotsky's, (1978) The concept of social constructivism emphasises that learning occurs through social interaction, where individuals become active participants in a shared knowledge community.

Any attempt to adapt or extend the CoI framework, however, must remain consistent with its historical foundations. To further explain learner motivation and engagement within this process, the present study also draws upon SDT (Deci et al., 1985) and its sub-theory, cognitive evaluation theory (CET), highlights how learners' motivation is shaped when their experiences promote autonomy, build competence, and nurture relatedness (Nicholson, 2012; Ryan & Deci, 2000). Self-determination theory establishes a conceptual framework for explaining how external and internal motivational processes influence learning behaviour, whereas CET describes how perceived external rewards and feedback can either support or weaken intrinsic motivation. Together, these theories complement the CoI framework by addressing the motivational mechanisms that sustain learner engagement in online environments. In line with these foundational principles, this study examines how both extrinsic and intrinsic rewards influence learners' motivation and contribute to different types of learning outcomes.

The literature review highlights learning constructs like self-regulation, CoI presence, learning presence, and emotional presence that can be influenced by motivational experiences, particularly through the use of rewards. Within the CoI framework, rewards may play a supportive role across its three core elements. With regards to cognitive presence, rewards can enhance motivation, critical thinking, and self-regulation by reinforcing learners' efforts and persistence in problem-solving. Similarly, reward presence can encourage engagement, collaboration, and active participation by recognising contributions within the social presence. Within teaching presence, rewards can strengthen instructional motivation, timely facilitation, and constructive feedback by promoting a more responsive and interactive learning environment.

Figure1.1: Framework of fundamental mechanism of gamification: reward presence



Incorporating reward presence as an additional element may enhance the CoI framework by reinforcing ongoing learner motivation. Prior studies have consistently emphasized the central role of self-efficacy and self-regulated learning as core determinants of motivational processes (Shea & Bidjerano, 2012), the inclusion of rewards extends this perspective to include extrinsic and intrinsic regulation. The reward presence may influence the fundamental presences of the CoI model. Research suggests that receiving rewards evokes emotional responses such as happiness and satisfaction, enhancing cognitive, emotional, and behavioural engagement (Lee & Doh, 2012). Instructors can utilise rewards such as credit points, badges, and tokens to facilitate learning, recognise achievements, and encourage participation (Saraswati et al., 2020). Previous studies also support that tangible rewards significantly enhance students' cognitive and behavioural engagement, leading to improved learning performance (Xiao et al., 2023).

Figure 1.2: The role of reward presence in online learning contexts

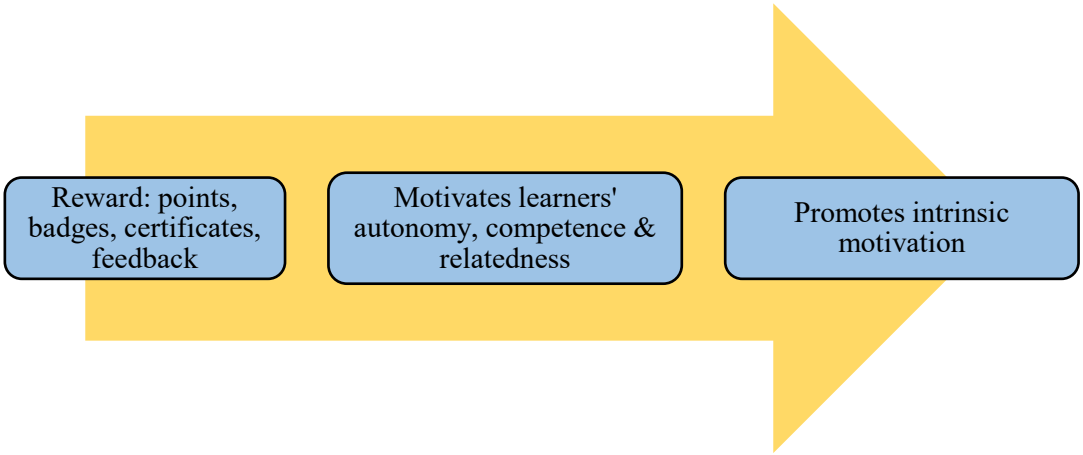


Figure 1.3. Inter-relation of reward with the presences

1.4 Statement of the Problem

Studying motivation in learning involves multiple terminologies, classifications, and theoretical approaches. Educational research has traditionally relied on primary studies from other fields, such as sociology and psychology, because many concepts cross disciplinary boundaries in human-focused research (Seale et al., 2018). Research across multiple areas indicates that rewards are both present and essential in online learning (Barata et al., 2017; Deci & Ryan, 2000; Goh et al., 2017; Sailer et al., 2017; Saraswati et al., 2020; Zimmerman et al., 1992). However, pedagogically designed motivational regulation, which involves increasing the elements of rewards that aid learning and regulating motivation to foster or enhance learning in a CoI, is not yet well explored.

The inclusion of a deeper understanding of reward presence as a distinct presence within the CoI framework is not addressed yet. The scope and extent of reward presence indicators in the CoI such as the design of reward-based motivation for practical application, along with its management and regulation, whether extrinsic or intrinsic have not yet been fully explored. Existing literature discusses broader concepts of motivation, including intrinsic and extrinsic motivation, gamification, and psychological rewards, focusing on their causes, correlates, consequences, and collective effects. However, these aspects remain largely unexamined as a distinct construct within the CoI framework. A theoretically grounded articulation of reward presence has the potential to advance the ongoing development of the CoI framework and provide a clearer picture of motivationally infused indicators such as self-regulation, and emotional presence within online learning contexts.

Therefore, the study aims to propose reward presence as an additional presence in the CoI framework to help investigate how structured reward strategies can enhance the three presences, ultimately improving the online CoI framework for learning outcomes.

1.5 Research Objectives of the Study

1. To assess the significance of rewards in enhancing engagement and motivational dynamics in an online learning environment.
2. To develop and validate a reward presence tool by conducting exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).

3. To validate the community of inquiry (CoI) scale (teaching, social, and cognitive presence) through CFA.
4. To assess the relationship of reward presence with teaching, social, and cognitive presences within the community of inquiry model.
5. To test whether reward presence functions as an additional presence in the CoI model by integrating it with teaching, social, and cognitive presences using SEM.

1.6 Hypotheses of the Study

Based on the stated research objectives, the following hypotheses are proposed.

H_{01}: There is no statistically significant relationship between reward presence and teaching presence.

H_{02}: There is no statistically significant relationship between reward presence and social presence.

H_{03}: There is no statistically significant relationship between reward presence and cognitive presence.

H_{04}: There is no statistically significant improvement in model fit with the inclusion of reward presence as an additional presence in the CoI model.

1.7 Operational Definitions of Core Constructs

1.7.1 Reward Presence

Reward presence refers to the perceived extent to which reward-based elements regulate and sustain learners' motivation within the online CoI framework, through both extrinsic and intrinsic motivational elements.

1.7.2 Community of Inquiry Model

Developed by Garrison, Anderson, and Archer (2000), the Community of Inquiry (CoI) framework explains meaningful learning in online contexts as the result of sustained interaction among cognitive, teaching, and social dimensions.

1.7.3 Teaching Presence

Teaching presence is operationally known for the learners' perception of the instructor's role in designing the course structure, facilitating interactions, and providing

direct instruction. In this study, it is measured using the teaching presence items from the validated community of inquiry (CoI) scale, with higher scores indicating a stronger perception of instructional support and guidance.

1.7.4 Cognitive Presence

Cognitive presence can be understood as the degree to which learners perceive and act upon opportunities for intentional inquiry, build and affirm knowledge, and transfer learning within digital learning environments. It is measured by using the cognitive presence items from the CoI scale, with higher scores reflecting deeper cognitive engagement and learning.

1.7.5 Social Presence

Social presence can be operationally described as learners' perception of a supportive and interactive online learning environment in which they feel comfortable expressing themselves, interacting with peers, and contributing to collective learning. In this study, it is measured using the social presence items from the CoI scale, with higher scores indicating stronger social interaction and sense of community.

CHAPTER - II

REVIEW OF LITERATURE

Chapter-II

Review of Related Literature

2.1 Overview

Motivation is recognised as a multifaceted, dynamic process involving the coordinated interaction of various socio-psychological sub-systems. These include intrinsic and extrinsic motivation, psychological needs, social and environmental influences, cognitive, creativity and emotional factors, reinforcement and rewards, and identity-based motivation(Ariani, 2017; Dayan et al., 2002; Deci et al., 1985; Ryan & Deci, 2000; Weiner, 1985). The complexity of this definition emphasises the impact of motivation on human learning across all stages (Brewer et al., 2005; Sheldon et al., 2008; Tasgin et al., 2018). Previous research has consistently shown that learner motivation has strong association with academic outcomes, such as persistence (Vallerand & Blssonnette, 1992), goal attainment and self-regulation (Werner & Milyavskaya, 2018), course satisfaction (Chui Yean, 2016; Fujita-Starck, 1994) learning outcomes and retention (Lepper & Cordova, 1992), and overall academic achievement (Eccles et al., 1993). The results emphasise the essential role of motivation in shaping student engagement, performance, and long-term educational success. Given its significant impact, research evidence suggests that motivation should be a key consideration in online learning environments, where learner engagement and persistence are particularly challenging. Therefore, the design and implementation of the Community of Inquiry (CoI) framework must purposefully incorporate motivational elements, ensuring that students remain actively engaged and achieve meaningful learning experiences.

The study of motivation presents a significant challenge due to the diverse terminology, classification systems, and theoretical perspectives that exist across disciplines (Dell, 2021). Educational research has long relied on foundational studies from other fields, as many motivation-related concepts intersect with various areas of human subject research (Seale et al., 2018). Therefore, this literature review adopts a multidisciplinary approach, critically examining existing knowledge on motivation and learning by drawing insights from psychology, neuroscience, and behavioural studies.

The literature review in this study encompasses key areas of research, including an in-depth examination of previous studies on the evolution of motivation terminology

and theories, the association between motivation and learning processes. Additionally, the role of motivation in online learning environments and motivation through the lens of gamification and rewards. The literature review is structured around the community of inquiry (CoI) framework, its extended presences, and the proposed reward presence, providing a comprehensive understanding of how motivation interacts with learning processes in online settings.

2.2 The Evolution of Motivation Terminologies and Theories

Before undertaking a study on motivation, it is essential to examine the existing literature to understand how motivation has been conceptualised and operationalised in prior research. Over the years, numerous terminologies and theoretical frameworks have emerged, each offering distinct yet overlapping insights into the mechanisms that drive human motivation. This review of literature explores the key terminologies associated with motivation and examines major theoretical frameworks that have influenced research in this domain. Table 1 presents an overview of key motivational theories that have served as foundational frameworks in previous research.

Table 1: Motivational theories

Theory Name	Originator	Key Terms	Year
Hierarchical Model of Human Needs (Maslow, 1943)	Maslow	Stages of Human Needs (Physiological to Self-Actualization)	1943
Achievement Motivation Theory (Atkinson, 1957)	John William Atkinson	Tendency to Achieve Success (Ts)	1957
Operant Conditioning (Skinner, 1965)	B.F. Skinner	Reinforcement	1965
Achievement Motivation Theory (McClelland, 1961)	McClelland	Need for Achievement (nAch)	1961
Attribution theory (Weiner, 1985)	Bernard Weiner	Locus of Control	1985
Social Cognitive Theory (A Bandura, 1986)	Bandura	Self-Efficacy	1986
Goal-Setting Theory (Locke & Latham, 1990)	Locke & Latham	Specific Goals	1990
Self-Determination Theory (SDT) (E. Deci et al., 1985; E. L. Deci & Ryan, 2000)	Deci & Ryan	Autonomy, Competency, Relatedness	1985, 2000

Expectancy-Value Theory (EVT) (J. S. Eccles & Wigfield, 2002)	Eccles & Wigfield	Expectancy	2002
Self-Regulation Theory (BJ Zimmerman, 2000)	Zimmerman	Self-Monitoring	2000
Gamification and Motivation (Deterding et al., 2011)	Deterding et al.	Meaningful Gamification	2011

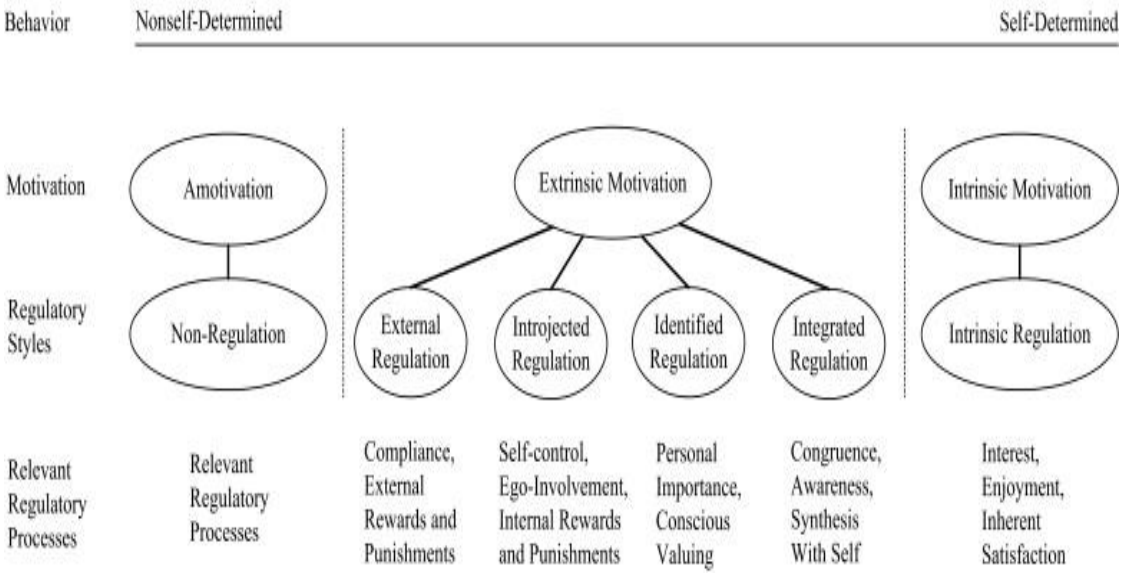
Comprehensively, motivational theories are generally classified into two broad categories: content-based approaches and process-oriented approaches.(Campbell et al., 1970). Content approaches emphasise on internal needs and drives (e.g., Maslow, Herzberg, McClelland), while process theories emphasise cognitive mechanisms such as goal-setting, expectancy, and equity-based thinking (Robbins et al., 2019). These theories conceptualise motivation as an outcome of internal drives that propel individuals toward goal attainment, fulfilment, and productivity. Several major content-based theories of motivation have been proposed, such as "Maslow's Hierarchy of Needs," "Alderfer's ERG Theory," "Herzberg's Two-Factor Theory," and "McClelland's Theory of Needs." In contrast, process theories emphasise the cognitive mechanisms underlying motivation, such as goal-setting, perceptions of fairness, and expectancy beliefs, which shape how employees engage with their work and align with organisational objectives. These frameworks provide valuable insights into developing strategic workplace interventions that aim to enhance employee engagement, satisfaction, and overall performance (Sahito & Vaisanen, 2017).

In recent educational research, two of the most widely applied motivational theories are Bandura's self-efficacy theory (Bandura, 1986) and Deci and Ryan's SDT (Deci et al., 1985; Ryan & Deci, 2000), both of which provide critical understanding into learners' motivation, participation, and learning outcomes. In Bandura's self-efficacy theory, self-efficacy is defined as "people's judgments of their capabilities to organise and execute courses of action required to attain designated types of performances (Bandura, 1986). It is concerned not with the skills one has but with the judgments of what one can do with whatever skills one possesses." Self-efficacy plays a crucial role in learning, influencing activity choices, effort, and persistence (Bandura, 1986; Schunk, 1989; Zimmerman et al., 1992). Bandura posits that individuals form expectations about cause and effect based on experience, which helps to develop beliefs about their ability

to handle specific situations. Applied to learning, this indicates that children with great academic self-efficacy are more likely to achieve higher success (Anthony Lorsbach & Jerry L. Jinks, 1999).” The theory has gained significant popularity in digital learning fields, leading to the growth and widespread adoption of various self-efficacy scales (W. A. Zimmerman & Kulikowich, 2016).

In similar context, SDT (Deci et al., 1985; Deci & Ryan, 2000) offers an extensive theoretical view for examining motivation highlighting three core psychological needs which are autonomy, competence, and relatedness (Chen & Jang, 2010). Pintrich & Schunk (2002), recognised STD as one of the most comprehensive and empirically validated frameworks for understanding motivation. In STD, autonomy refers to an individual’s feeling of control and agency in their actions, competence relates to the perception of one’s ability to master tasks and challenges, and relatedness reflects the importance of social relations and a feeling of familiarity. Unlike Bandura’s social cognitive theory, SDT differentiates motivation into three distinct types: intrinsic motivation refers to engagement driven by personal interest and enjoyment, whereas extrinsic, which is shaped by external incentives or constraints; and amotivation, marked by the absence of intentional action. Recently, SDT has gained considerable attention in the context of online learning, particularly for its potential to address persistent challenges such as student attrition (Chen & Jang, 2010). Existing research has investigated how SDT can be incorporated into online learning settings, with special attention to gamification practices. Studies examine how SDT’s core principles, such as autonomy, competence, and relatedness, can guide the development of digital learning experiences that foster engagement and motivation. By aligning gamification elements with SDT, researchers aim to enhance student engagement, persistence, and overall learning outcomes in online education.

Figure 2.1: The self-determination spectrum (Source: Chen & Jang, (2010)



Motivation in Learning

Motivation is an essential element that is needed for quality education (Vero et al., 2017). Recent research on motivation revealed that motivation: intrinsic-extrinsic, rewards, goal attainment motivation can strongly influence students' engagement, student success, academic performance, motivation, collaborative learning, and knowledge acquisition (Saeed et al., 2012; Schoor et al., 2011). Previous studies on motivation highlight the significance of motivation in online learning settings (Chen & Jang, 2010). Gabrielle (2003), in his study on designing technology-based instructional strategies for online learners, revealed that ARCS-based support significantly boosted students' motivation, performance, and self-directed learning (Chen & Jang, 2010). Frick et al. (2009) examined teaching-learning process in both face-to-face and online settings using student course evaluations. The study found strong positive correlations among principles of instruction, student satisfaction, learning progress, and overall course quality (Kim & Frick, 2011). Through these studies, researchers gain a clearer understanding of how motivation influences the online CoI.

2.3 Studies Related to the Community of Inquiry (CoI) Framework

The rise in online engagement in the late 1990s led researchers to identify key elements for effective online education. Scholars at the University of Alberta, including Randy Garrison, Terry Anderson, and Walter Archer advanced the view that asynchronous online learning could foster communication between students and

instructors, countering the belief that technology would eliminate interaction. Their observations of online discussions contributed in the establishment of the CoI model (Akyol & Garrison, 2013; Garrison et al., 2000, 2001; Rourke et al., 1999). Grounded in social constructivism and John Dewey's educational philosophy, the CoI framework conceptualizes the core components necessary for a meaningful online higher education experience (Garrison, 2017). It is widely regarded as one of the most cited and influential frameworks in the field of distance education practice and design(Williams, 2017).

The presences within the CoI framework have been incorporated into a widely used survey instrument (Arbaugh et al., 2008), which has been extensively validated through numerous studies. These studies primarily focused on the structure at the presence level and, more recently, have confirmed the validity of the detailed categories within the presences (Dell, 2019; Caskurlu, 2018). The framework serves as a significant theoretical model in the study of online learning for understanding learning through the interplay of teaching presence, social presence, and cognitive presence. Teaching presence involves designing, supporting, and managing collaborative and cognitive dynamics that support meaningful understanding, a concept similar to traditional teaching (Akyol et al., 2011). It includes three key components: instructional management (curriculum design, assessment, and time structuring), building understanding, and teacher-led instruction instruction (Garrison et al., 2000). Overall, teaching presence emphasises socio-cognitive engagement and knowledge construction through instructional support. Social presence refers to learners' ability to present themselves as real individuals in an online setting (Garrison et al., 2000). It fosters emotional expression, group cohesion, and open communication, which enhance cognitive presence and engagement. Cognitive presence is known as the dimension of online learning that facilitates knowledge construction through research and discussions (Garrison & Arbaugh, 2007). It includes four stages such as triggering events (identifying issues), exploration (investigating ideas), integration (synthesising knowledge), and resolution (applying learning).

The CoI framework has been widely explored in the context of online learning, with researchers continuously examining its impact on various educational factors. (Swan et al., 2009) highlighted the critical role of teaching presence, demonstrating its strong relationship with cognitive presence, perceived learning, and course satisfaction. Their study reinforced the idea that effective Teaching presence enhances both the learning

experience and overall course engagement. Building on this, Garrison et al. (2010) revisited the framework a decade later, providing insights into its evolution and expanding on recent methodological developments.

As research on the CoI framework gained momentum, scholars sought to validate its effectiveness across different learning environments. For instance, (Lambert et al., 2013) examined its application in online courses, revealing that while the model was well-integrated, some students experienced challenges in self-expression. Boston et al. (2009) investigated the association between CoI and learner retention, analysing data from over 28,000 students. Their findings emphasised that social presence, the ability to perceive peers as real individuals, was the strongest predictor of re-enrolment, with affective expression, group cohesion, and open communication playing key roles in student persistence.

Further research explored how technological affordances impact CoI elements. Rubin et al. (2013) explored the role of learning management systems (LMS), revealing that LMS affordances significantly impact teaching, cognitive, and social presence, with ease of communication emerging as the most influential factor in student satisfaction. In a related study, (Joksimovic et al., 2014) applied linguistic analysis to online discussions, demonstrating how language patterns evolve through the different cognitive presence phases with tentative words being more common in the triggering phase, while causal and insight words became more prevalent in the integration and resolution phases. These studies provided new insights into how linguistic complexity correlates with cognitive engagement in online learning.

In a more recent investigation, (Lim & Education, 2022) explored disciplinary differences in CoI perceptions. Their study found that while teaching presence was valued across disciplines, social presence varied; students in soft disciplines (e.g., psychology, education) preferred interaction and discussions, whereas those in hard-applied fields (e.g., engineering, information sciences) relied less on peer engagement. This highlighted the need for discipline-specific instructional strategies to optimise online learning experiences.

The growing focus on gender equality in education has also shaped recent CoI research. Aldosemani et al., (2024) examined the experiences of female students from Saudi Arabia in online courses taught by male instructors. Their findings indicated that

while teaching presence was well-received, social presence was more complex. Online education has reduced gender barriers and increased participation; however, the lack of real-time interaction has limited deeper engagement. Their study reveals the potential of online education in providing greater accessibility for women in gender-segregated environments.

Most recently, Zhou et al. (2025) integrated expectation-confirmation theory (ECT) with CoI to examine course continuance intention. Their study measured teaching, cognitive, and social presences with students' expectations. The findings revealed that confirmed expectations strongly influence retention, with CTP and CCP affecting course satisfaction and CSP enhancing engagement through the flow experience. This study provided a new perspective on how expectation fulfilment can drive sustained participation in online learning.

2.4 Research on Learning Presence, Emotional Presence and Institutional Presence

Over time, the CoI model has evolved to encompass the additional presences, including learning presence (2010), emotional presence (2012), and later institutional presence (2023), to enhance its effectiveness in facilitating better learning experiences. This expansion is supported by later reflections on the CoI framework, which emphasise that the model is not exhaustive and may require the incorporation of additional influencing factors to more fully explain learning processes in online settings (Garrison et al., 2010).

In 2012, Shea and Bidjerano expanded the CoI model by proposing learning presence, underscoring the importance of self-regulation and active participation. Learning presence has a distinct impact on cognitive engagement, collaboration, and performance (Shea et al., 2012). Notably, students with higher self-regulation exhibited better academic outcomes, emphasising the need for instructional strategies that foster self-monitoring and strategic planning. Even though self-regulation increases the flexibility of students, it may still face difficulty in terms of integrating with teaching presence (Pool et al., 2017). Similarly, a study revealed that learning presence is the strongest predictor of cognitive presence, further reinforcing its significance in online learning (Wertz, 2022). Self-regulation is a stronger influencer than motivation, with cognitive presence emerging as the most significant mediating factor; self-regulation and

cognitive engagement can improve the overall learning experience (Farrokhnia et al., 2025).

Meanwhile, empirical investigations examining emotional presence and institutional presence within the community of inquiry (CoI) model remain relatively limited. Previous studies on emotional presence confirmed that emotional presence enhances engagement within the CoI (Cleveland-Innes & Campbell, 2012; Majeski et al., 2018). Extending the CoI model further, Zhang and Zhu's institutional presence demonstrated a crucial role in supporting learning within online and blended environments (Zhang & Zhu, 2023).

Building on these extensions, the next section introduces reward presence as a new dimension, emphasising how structured rewards and Gamification has the potential to strengthen both intrinsic and extrinsic forms of motivation, thereby fostering deeper and meaningful learning experiences within the CoI framework.

2.5 Reward Presence

Since this study aims to introduce reward as a novel construct integrated into the community of inquiry model, it is essential to integrate existing research that examines the functions of rewards and gamification in online learning. The structured reward systems and gamification elements that enhance both intrinsic and extrinsic motivation contribute to sustained learner engagement. Grounded in self-determination theory (Deci & Ryan, 1985), this study emphasises the role of well-designed reward mechanisms in supporting autonomy, competence, and relatedness, key psychological needs that are essential for long-term motivation. By addressing these needs, reward presence can propose itself as an additional presence to enhance the CoI model.

Therefore, a comprehensive review of previous studies on key concepts such as gamification, rewards, and self-determination theory in online learning has been conducted to deepen the concept of reward presence within the CoI framework. After reviewing the literature, only studies with clear, evidence-based findings were selected. Table 2 summarises key research work of gamification and rewards in online community, highlighting their methodologies and key outcomes.

Table 2: Previous research on gamification, rewards in online learning

Study Focus	Findings
Impact of gamification on student engagement in e-learning environment (Bouchrika et al., 2021).	Increase student's performance, engagement, and interactivity
Adaptive gamification aligned with learners' styles in online education (Hassan et al., 2021).	Developed a Gamification framework. Increase motivation, course completion, interest and interaction. Decrease dropout rates.
Challenge-based gamification and its effects on achievement, motivation, and flow (Kaya & Ercag, 2023).	Increase confidence, course satisfaction, whole level of motivation
Online learning readiness and attitudes toward gamified learning: A mixed-methods study (Bovermann et al., 2018).	Motivated and satisfied with gamification learning. High acceptance of gamification among students and improve autonomy.
Sustainability of online learning through gamification strategies (Park et al., 2021).	Positive impact on learner motivation, engagement, and comprehension of educational content. Badges, points, and leaderboards were effective in reducing stress and fostering a sense of accomplishment.
Teachers' perceptions of gamification techniques in online education (Alabbasi, 2018).	Teachers view gamification positively, citing increased student motivation, engagement, and satisfaction.
Implementation of gamification in Moodle and its influence on engagement and performance (Poondej et al., 2019)	High satisfaction with the gamified course design, increased motivation and engagement. Active participation and improved academic performance
Student engagement in gamified online discussion forums (Ding et al., 2017)	Gamification enhanced behavioural, emotional, and cognitive engagement,
Gamification and its relationship with motivation in higher education (Torrado Cespón & Díaz Lage, 2022).	Gamification increased motivation and engagement.
Comparison of tangible and intangible rewards in gamified online learning (Xiao & Hew, 2024)	Tangible rewards effectively increase students' task interest, encouragement to complete class tasks and final exam performance
Student and teacher perceptions of rewards in online English instruction (Saraswati et al., 2020)	Rewards positively influenced both academic and non-academic aspects of student performance

Effects of tangible rewards on performance and knowledge construction in fully online gamified contexts (Bai & Gonda, 2021).	Increase student participation in posts and replies, may improve student engagement
Neuroscientific perspectives on rewards, motivation, and learning (Hidi, 2016)	Reward is beneficial when the student is not motivated.

The above studies (Table 2) consistently highlight the significant roles of gamification and rewards in online learning. The studies confirm that designs of gamification and psychological rewards can help to increase students' participation, engagement, motivation, etc. Drawing from motivational theories, particularly the self-determination theory, may help to construct the concept of 'reward presence' that connects both gamification and psychological rewards. This presence may be conceptualized as an extension of the community of inquiry (CoI) framework, potentially exerting both direct and indirect effects on teaching presence, social presence, and cognitive presence to enhance the overall learning experience. Although the community of inquiry (CoI) framework thoroughly addresses teaching, social, and cognitive presences in online learning, it provides limited explanation regarding how learner motivation is managed and maintained. These gaps highlight the need to extend the framework for motivational dynamics.

2.6 Research Gaps of the Study

The literature reviewed in this chapter has identified three key research gaps that collectively justify the inclusion of reward presence as an additional dimension in the community of inquiry (CoI) framework.

a) Knowledge gap: The study identified a knowledge gap in the existing literature, emphasizing the need for further investigation into the relationships among the three core presences of the community of inquiry framework: teaching, cognitive, and social as well as the potential inclusion of additional presences. The existing knowledge gap in motivation, previously explored through the concept of learning presence, may be further enriched by incorporating the element of reward presence. This addition may provide a much-needed comprehensive understanding of how external incentives influence motivation in the learning process.

b) Theoretical gap: The review of related literature revealed a theoretical gap concerning the inclusion of an additional element, learning presence, and its associated theoretical foundation, self-efficacy theory. Notably, self-efficacy theory appears to lack a comprehensive focus on external and internal rewards, which are critical for fostering full engagement in the learning process. This gap reveals the need for further theoretical exploration to integrate these motivational dimensions in the framework.

c) Practical Applicability Gap: The review identified a practical applicability gap in the practical application of the CoI framework. While the framework has been extensively studied and validated in theoretical contexts, its practical application in real-world online learning environments remains underexplored. Challenges such as technological infrastructure, digital literacy, and cultural diversity may impact the framework's effectiveness, highlighting the need for research that connects theoretical perspectives with practical implementation to ensure its relevance and adaptability in diverse educational settings.

Thus, the three significant research gaps emphasised the need to enhance the community of inquiry (CoI) model by incorporating reward presence as an additional presence. This integration may help balance intrinsic and extrinsic motivation through gamification elements such as reward points, badges, gift cards, social recognition, and timely instructor feedback, fostering higher engagement, motivation, and learning effectiveness. Self-determination theory conceptualizes autonomy, competence, and relatedness as foundational psychological needs, offering a comprehensive lens through which diverse motivational regulations can be understood as drivers of sustained and meaningful learning experiences.

Expanding the well-established CoI framework to formally incorporate an additional presence of reward presence represents a meaningful theoretical advancement. Nevertheless, the literature reviewed in this chapter demonstrates that motivation plays a critical role across all stages of the learning process. In particular, recent studies on gamification, rewards, and self-determination theory emphasise the need for a systematic examination of motivation within the CoI framework. Despite the growing body of research on gamification and reward systems, no studies have specifically examined reward presence within the CoI framework or its relationship with teaching, social, and

cognitive presences. Accordingly, the present study seeks to fill these gaps in the existing literature by introducing reward presence as an additional presence within the CoI model, with the aim of strengthening its integration with existing presences to foster meaningful learning experiences.

CHAPTER - III

METHODOLOGY

Chapter-III

Research Design & Methodology

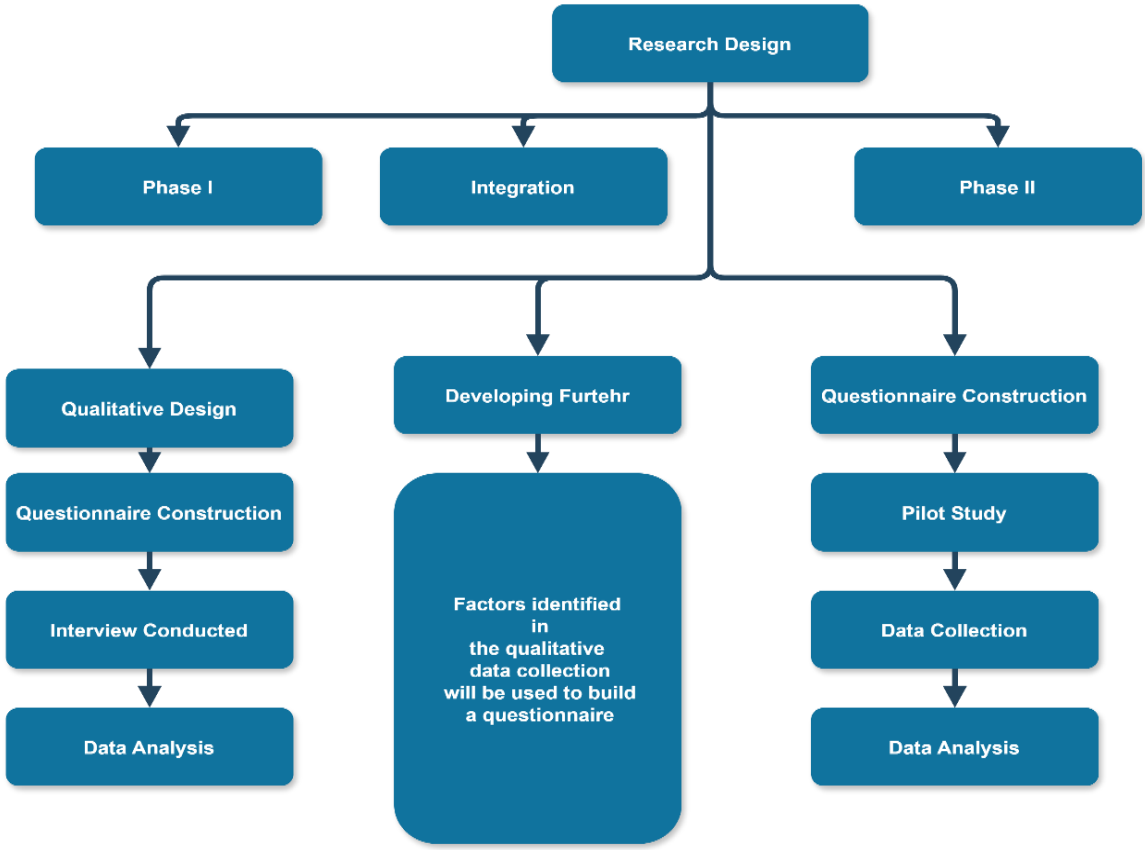
3.1 Study Overview

This chapter outlines the research design and methodological procedures employed to achieve the research objectives presented in chapter one. A mixed-methods design was employed to examine the role of rewards in online learning, validate the reward presence scale, and examine reward presence as a novel presence integrated into the CoI framework. Qualitative data were collected through semi-structured interviews and analysed using thematic analysis to explore learners' motivational experiences and perceptions of rewards in online learning. Quantitative responses were then obtained via a survey and analysed through diverse statistical methods, comprising exploratory and confirmatory factor analyses, regression modelling, path analysis, and structural equation modelling (SEM). Together, these methods allowed a detailed exploration and validation of the proposed research framework.

3.2. Research Design

To address the study's objectives, the investigator employed an exploratory sequential mixed methods design, (QUAL-QUAN) executed in two interdependent phases. The first phase involved the collection of qualitative data using semi-structured interview protocols enabling the formulation of hypotheses based on the insights gathered. The second phase builds on these findings by identifying key variables from the qualitative analysis and applying a descriptive survey design to test the variables using quantitative techniques. The complete research design is thoroughly explained in various sections of this chapter and is illustrated in Fig. 3.1.

Figure 3.1: Research design - exploratory sequential mixed method



3. 3 Qualitative Design (Phase I)

In this phase, the study seeks to critically examine the role and significance of rewards and gamification in online learning environments. To evaluate the relevance of reward presence as a potential dimension within the CoI framework, it was necessary to investigate whether rewards meaningfully influence learners' motivation and overall learning experiences in an online learning environment. Accordingly, the researcher employed a qualitative approach using semi-structured interviews to examine learners' perceptions, experiences, and interpretations of reward mechanisms in online learning contexts. The findings from this exploratory phase form the basis for constructing the reward presence scale and conducting further quantitative examination.

Participants and Setting

In phase I, the sample comprised students from Osmania University as well as Maulana Azad National Urdu University (MANUU), Hyderabad, Telangana. A total sample of twenty participants was involved in the qualitative phase, which falls within the accepted sample size for semi-structured interviews, where thematic saturation is

often achieved with 12 to 20 participants (Creswell & Poth, 2016; Guest et al., 2006). Consistent with the information power model articulated by Malterud et al. (2016), the sample was considered sufficient due to the narrow research focus and the contextual similarity among participants, which enhanced the depth and relevance of the collected data.

Sampling Technique

The sampling technique used in Phase I is purposive sampling. The participants are selected based on their participation in online learning platforms such as SWAYAM, Coursera, Udemy, and other e-learning platforms.

Data Collection Procedures

Data were collected through one-to-one semi-structured interviews conducted face-to-face at Osmania University and Maulana Azad National Urdu University (MANUU), Hyderabad, Telangana, with a total of twenty students who are engaged in online learning courses. For conducting the interview, the researcher asked and modified the questionnaire, following the interview guidelines, and simultaneously, with permission, recorded the interviews. The data collection is conducted between November 2024 and January 2025.

Data Analysis

The qualitative semi-structured interviews were audio-recorded, transcribed, and subsequently analysed using thematic analysis. This method was employed to systematically identify recurring patterns and themes within the interview data. Thematic analysis was chosen as it enables the systematic development of themes by grouping similar codes and patterns that emerge from participants' responses, allowing meaningful interpretation of the data. Following Braun and Clarke (2006), thematic analysis is carried out through a structured six-phase procedure that begins with immersion in the data, progresses to initial coding and theme development, and culminates in the refinement, naming, and reporting of themes. This process was carried out separately for each participant in the qualitative phase, and the findings informed the development of a quantitative survey to examine broader applicability and potential impact.

3.4 Quantitative Design (Phase II)

Following an in-depth analysis of semi-structured interviews on rewards as a motivational factor in online learning, the investigator proposes to introduce 'reward presence' as an extended dimension within the model, enhancing and strengthening the existing presences. To support this, a descriptive survey method has been employed, incorporating specifically designed scales for reward presence and the CoI scale. This approach aims to assess the relationship between the reward presence and each of the established presences within the CoI framework.

Population of the Study

The target population for the present study comprised higher education students engaged in online learning courses, including SWAYAM, Coursera, Udemy, and other e-learning systems. The accessible population was limited to students enrolled in Indian universities who were actively participating in online courses at the time of data collection or had prior experience with online learning as part of their academic programmes.

Sample Size

After the data collection process, 722 valid responses were retained for inclusion in the final analysis. Data were collected using a mixed-mode approach, comprising in-person visits to universities and online administration through a Google Form to enhance reach and participation. The sample included students from multiple institutions across Hyderabad, Uttar Pradesh, Delhi, Meghalaya, Assam, and Karnataka, ensuring representation from diverse geographic and institutional contexts. For the purposes of statistical analysis, the full sample was randomly divided into two equal subgroups, with 361 participants allocated for exploratory factor analysis (EFA) and 361 for confirmatory factor analysis (CFA), following standard guidelines for scale development and validation.

Sampling Technique

Phase II of the study employed criterion-based purposive sampling, a non-random sampling technique appropriate for theory testing and model development in educational research. Participants were selected based on predefined inclusion criteria: (a) enrolment as higher education students, and (b) current or prior participation in at least one online

course. This approach ensured that respondents possessed sufficient experience with online learning environments to meaningfully evaluate reward mechanisms and Community of Inquiry presences. Data collection involved outreach across central and state universities using both institutional and online access, allowing for adequate sample size and variability required for structural equation modelling.

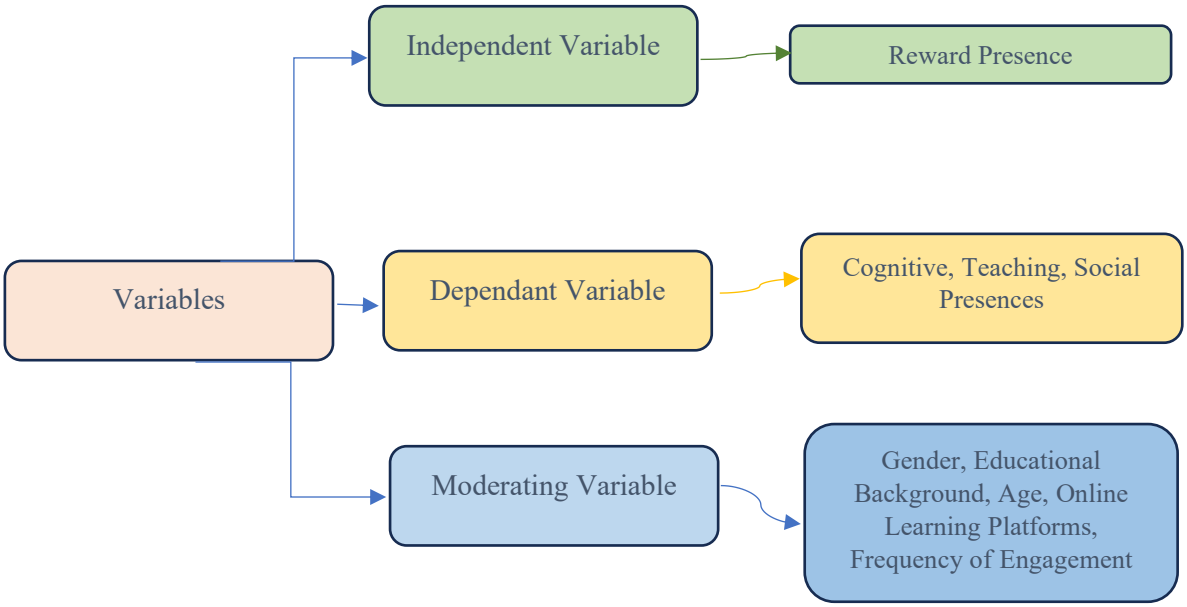
Variables

The investigator considered the following variables for the purpose of the study.

- **Independent Variable**
  - i) Reward Presence
- **Dependent Variable**
  - i) Cognitive Presence
  - ii) Teaching Presence
  - iii) Social Presence
- **Moderating Variables**
  - i) Gender
  - ii) Educational Background
  - iii) Age
  - iv) Online Learning Platforms
  - v) Frequency of Engagement

The variables of the study can be presented in the following manner:

Figure 3.2: Variables of phase II data collection



Tools Used for Data Collection

The community of inquiry instrument and the researcher-developed reward presence scale, which measures motivational dimensions, were used to collect data. Simultaneously, learners' profiles are also used for reliable data collection. The tools were focused purely on the construct of cognitive, teaching, and social presences, and reward presence.

Profile of the Student

A profile of the student is created to collect personal details of the learner. It includes information such as name, age, gender, educational background, and the online platform they have used.

3.5 Community of Inquiry (CoI) Survey Instrument

To measure the core elements of the community of inquiry framework, the study employed the survey instrument introduced by Arbaugh et al. (2008). This instrument operationalizes the three foundational constructs of the model: teaching presence, social presence, and cognitive presence. Participants responded using a five-point Likert-type scale. The scale comprises 34 items in total, distributed across teaching presence (13 items), social presence (9 items), and cognitive presence (12 items). Previous validation studies report strong internal consistency for each construct, with Cronbach's alpha values above .90, indicating excellent reliability across all three dimensions.

3.6 Construction and Standardisation of the Reward Presence Scale

The present study used two instruments: a standardised scale, namely the CoI scale, and a researcher-developed reward presence scale to measure motivational factors within the CoI framework, based on self-determination theory.

Need for Development of a Tool

The initial stage of tool construction is searching for available tools that exist in the dimension. A total of twenty-four available scales were found to measure different dimensions of motivation. The scales are extracted from the time period of 1992 to 2019. All the scales describe different parts of motivation. All the scales used in this study represent different aspects of motivation and user experience. The specific constructs measured by each scale, such as the tendency to engage or the experience of GAMEFUL

interactions, have already been described in detail in Chapter two. Therefore, this section focuses only on how the scales are applied in the current study, without repeating the earlier citations.

Although several existing scales address specific motivational constructs, none fully capture the integrated motivational experience required for the present study. A careful review of existing instruments revealed that they assess motivation, gamification, or engagement in isolation, rather than as a cohesive mechanism operating within an online learning framework. The present study required a tool grounded in SDT that integrates constructs related to gamification, intrinsic and extrinsic motivation, competence, relatedness, and accountability in order to examine how motivational regulation operates in online learning environments. Therefore, to address this conceptual gap and align with the CoI framework, the researcher developed the reward presence scale as an additional presence to capture the motivational dimension of online learning.

Process of Scale Construction

Test construction is a detailed and structured process that demands careful planning, subject expertise, technical precision, and relevant experience. The development of a scale typically involves the following key phases:

a) Planning phase
b) Construction phase
c) Standardisation phase

Planning Phase

In this phase, the researcher prepared the blueprint of the tool, which includes types of tools, samples, response patterns, available tools, and expert suggestions. The planning phase includes

a) Identification of reward presence dimensions
b) Operational definition of reward presence
c) Purpose of the tool
d) Target population
e) Test items
f) Methodology of scale construction

Identification of the Reward Presence dimension

For the identification of the reward presence component, adopting a theoretical framework is the main source. Decy and Ryan (2000 motivational theory, i.e., self-determination theory, is the central theory for the development of the reward presence construct. The theory identifies three core components that are needed to foster intrinsic motivation and psychological well-being (Deci & Ryan, 2000). These components are:

- **Autonomy**: The drive to have control over one's actions and personal goals, reflecting an individual's perception of freedom and self-direction in making decisions.
- **Competence**: The psychological need to develop abilities, attain mastery, and experience effectiveness in one's actions, reflected in confidence and the ability to manage challenges successfully.
- **Relatedness**: The drive to establish meaningful connections with others, experience a sense of belonging, and engage in supportive and caring relationships.

By keeping in mind the above-mentioned dimensions, the reward presence scale may have included the following dimensions: external regulation (performance-based reward), external regulation (material reward), external regulation (social reward), introjected regulation, identified regulation, integrated regulation, intrinsic motivation, autonomy, competence, relatedness. Thus, the reward presence scale has been constructed by keeping in mind all the above-mentioned dimensions.

Purpose of the Tool

The purpose of the reward presence scale is to measure learners' motivational regulation in online learning environments by capturing how extrinsic and psychological rewards, grounded in SDT, operate as a distinct motivational presence within the CoI framework.

Target Population

The present study has purposefully targeted higher education students who have been a part of an online learning community. The category of online learning platforms is SWAYAM, NPTEL, and commonwealth of learning, and any online learning courses performed by the learner have been selected as the targeted population.

Test Items

The scale presents items as declarative statements, and students indicate their level of agreement using a five-point Likert scale, ranging from 'strongly agree' to 'strongly disagree,' reflecting their individual perspectives.

Methodology for Scale Construction

The reward presence scale was developed using the Likert method of 5-points rating scale, with items designed to measure learners' motivational regulation in online learning.

Construction Phase

The construction phase involves developing, testing, and refining the scale items. These steps ensure the tool is clear, valid, and reliable. Key steps include:

i. Writing items
ii. Taking expert feedback
iii. Preparing a preliminary draft
iv. Drafting clear instructions
v. Item refinement through exploratory factor analysis (EFA)

Writing Items

Scale construction starts with writing the items. In the present study, Item writing is a creative process, shaped by the researcher's intuition, imagination, experience, consistent practice, and daily observations. Since many items may later be discarded during analysis, it is important to generate a large pool initially. In the absence of fixed guidelines for item construction, the researcher must approach the task with great care and attention.

The researcher tried to gather sources of item writing from previous literature, colleagues, senior researchers, and experts. The researcher developed the items based on information collected from both primary and secondary sources. Initially, 45 items related to reward presence were constructed. The preliminary draft of the scale was then reviewed with the supervisor, and necessary modifications were made accordingly.

Expert Opinion

The pre-try-out stage involves seeking expert feedback to enhance the tool. This process helps clarify ambiguous wording, improve weak alternatives, and remove unsuitable items. The scale was shared with subject experts for their evaluation and input. Based on their suggestions and comments, the tool was revised accordingly. Items were then edited, modified, or eliminated as needed, and organised appropriately following the experts' recommendations. The scale was reviewed by experts with extensive experience in the field of education to assess it for clarity, duplication, and grammatical accuracy.

Experts were asked to critically evaluate each statement for its relevance to reward presence, with a definition provided for clarity. They were requested to mark each item as 'accept', 'reject', or 'modify'. Based on their feedback, the researcher and supervisor reviewed the suggestions in relation to the ten dimensions of reward presence. The initial draft of the scale included 36 items.

Preliminary Draft

The initial version of the scale consisted of 36 items. These items were initially organized into three main dimensions. External motivation includes 10 items across three sub-dimensions: performance-based rewards, material rewards, and social rewards. Similarly, intrinsic motivation includes 12 items across four sub-dimensions: introjected regulation, identified regulation, integrated regulation, and intrinsic motivation. Moreover, basic psychological needs include 14 items under three dimensions: autonomy, competence, and relatedness. Table 3.2 presents the distribution of items across each dimension of the scale.

Table 3.1: Item allocation across dimensions in the preliminary reward presence scale

Sl. No.	Items	Total Items
External Regulation: Performance-based Reward		
1	I enrol in online courses to earn certificates or badges from the portal.	**3**
2	Seeing my name on the leaderboard motivates me to complete the assignments.	
3	Earning credit points/virtual avatar boosts my motivation and active participation in this course.	

External Regulation: Material Reward		
4	I am more likely to put in extra effort when there is a gift coupon or cash reward for completing an online course.	**3**
5	The availability of bonus points, gift cards, stickers influence my decision to take part in online courses.	
6	A cash prize or gifts motivate me to achieve the targeted objective in online courses.	
External Regulation: Social Reward		
7	Receiving feedback from the course instructor helps me better understand my strengths and weaknesses.	**4**
8	Feedback that acknowledges my progress and growth enhances my confidence and motivation.	
9	Receiving praise and recognition from peers motivates me to participate in this course.	
10	Encouraging feedback from the course instructor energizes my motivation to overcome various challenges during the course.	
Introjected Regulation		
11	I participate in this course to avoid feeling guilty of not completing it.	**3**
12	I am concerned about what others will think of me if I don't participate in the discussion forum.	
13	I prioritize the assignments because I want to maintain a positive image of myself in the eyes of my learning community.	
Identified Regulation		
14	I value the content of this course as it motivates me to learn.	**3**
15	Even though the course is difficult to understand, I will put effort because of the meaningfulness of the course.	
16	I put effort into this course because I understand its relevance to my personal/professional development.	
Integrated Regulation		
17	Engaging in the course aligns with my identity as a dedicated lifelong learner.	**3**
18	I am motivated to excel in the course because it is aligned with my vision of who I want to be.	
19	I am motivated to pursue this course because it allows me to be true to myself in my curiosity of learning new things.	
Intrinsic Motivation		
20	I actively participate during the course because it aligns with my personal interest.	**3**

21	I feel a sense of happiness when I am immersed during the course-related activities like assignments, discussion forums etc.	
22	I am motivated to participate during the course because it is a fun and engaging experience.	
Autonomy		
23	Earning different types of rewards makes me feel empowered to shape my own learning journey.	**3**
24	The rewards allow me to choose how to participate in forums, self-assessments, and assignments, giving me a sense of control.	
25	I feel confident that the gamified rewards let me take ownership of how I engage with the course.	
Competence		
26	Earning rewards for assignments makes me feel confident in achieving course objectives.	**4**
27	I feel capable of overcoming obstacles and achieving my learning goals in the course.	
28	Receiving rewards gives me a sense of accomplishment when I perform well.	
29	I believe in my ability to grow and improve my skills over time.	
Relatedness		
30	Recognition through rewards makes me feel supported and motivated.	**7**
31	Receiving positive recognition or rewards for my contributions in forums makes me feel valued and respected.	
32	Sharing rewards (badges, leaderboard ranks) helps me feel connected to my peers.	
33	I appreciate the opportunity to learn from others and contribute to their learning as well.	
34	I don't see the rewards in this course that make the learning worthwhile.	
35	Even with rewards, I often feel there is no point in putting effort into this course.	
36	The rewards do not really motivate me because I don't find value in the course itself.	

The following instructions were provided at the beginning of the scale for respondents:

i. Fill in the required details such as your name, gender, educational background, age, and online platform name.

ii. The scale consists of a total of 36 items.

iii. Each item offers five response options, ranging from Strongly Agree to Strongly Disagree.

iv. Mark your answer by placing a tick (✓) in the box corresponding to your choice.

v. All responses are valued; there are no correct or incorrect answers.

vi. Kindly provide valuable response to each statement on the scale.

vii. There is no fixed time limit, but it is recommended to complete the scale within 10 to 15 minutes.

Item Refinement

Experts examined the original 36-item pool to improve clarity, verify content relevance, and ensure coherence with the theoretical construct of reward presence. Instead of conducting a separate pilot study, the items were empirically evaluated using EFA on a subsample of the main dataset (n = 361). Using a subsample for initial item testing is an accepted approach in scale development, as early empirical testing within the main dataset can effectively replace a standalone pilot while maintaining psychometric rigour. This procedure allowed for the identification and removal of poorly performing items, ensuring that the final scale retained only the most valid and reliable indicators across all dimensions. This approach is consistent with recommended scale development practices, which state that item refinement can be conducted directly through factor-analytic procedures on the main sample when expert review has been conducted and the sample size is sufficient (DeVellis & Thorpe, 2021; Worthington et al., 2006). The EFA results guided the removal of poorly performing items, ensuring that the retained items demonstrated strong factor loadings and conceptual alignment across all dimensions. Subsequently, confirmatory factor analysis (CFA) was undertaken on the entire dataset to validate the final factor structure and establish the reliability and validity of the reward presence scale.

3.7 Statistical Techniques

After the completion of data collection, the researcher used appropriate statistical techniques to analyse and interpret the data. The investigator analysed the data quantitatively using SPSS (Statistical Package for the Social Sciences) and AMOS (Analysis of Moment Structures). The investigator employed both descriptive and inferential statistics to facilitate a comprehensive analysis and interpretation of the data.

Descriptive Statistics

The basic features of the data can be described using descriptive statistics. The present study employed various descriptive statistics to offer a clear quantitative overview of the sample and related measures. The key statistical tools used included the mean, standard deviation, simple percentages, and graphical representations of data. These methods are detailed in the following sections.

1. **Mean and Standard Deviation:** The mean was calculated to determine the central tendency of the distribution of scores related to teaching presence, social presence and cognitive presence as core community of inquiry elements, then reward presence, learning presence, and emotional presence among online learners. Additionally, the standard deviation was computed to analyse the variability in these scores and to facilitate further advanced statistical analyses.
2. **Z-score and P value:** The Z-score was computed to standardize the data, allowing for the comparison of individual scores relative to the overall distribution of teaching presence, social presence, cognitive presence, reward presence, learning presence, and emotional presence among online learners. This helped identify outliers and understand the relative positioning of scores. Furthermore, the p-value was calculated to evaluate the statistical significance of differences and associations observed in the study, thereby supporting the reliability of the conclusions drawn from the data analysis.
3. **Graphical Representation:** The graphical diagrams were used to understand the facts and relations of the community of inquiry elements, additional elements and reward presence.

Normality of the Test

To interpret the data, the study employed correlation analysis, factor analysis, structural equation modelling (SEM), and path analysis techniques. These tests are based on the assumption of normality. Therefore, before conducting these tests in the present study, the test of normality was applied using SPSS. This includes the ‘Kolmogorov-Smirnov’ and ‘Shapiro-Wilk’ tests, as well as the tests for ‘skewness’ and ‘kurtosis’ in the case of community of inquiry model presences and the present construct reward presence, with reference to different dependent and independent variables. The result of these tests shows that the distributions of these scores are approximately. normally

distributed. To analyse the collected data, different inferential statistics were also used in the present study.

Inferential Statistics

Inferential statistics are employed to draw conclusions about a larger population based on data obtained from a representative sample. Parametric inferential techniques are applied when specific conditions are met, such as a normally distributed dataset, a sufficiently large sample size, homogeneity of variances across groups, and the use of numerical data that allows for arithmetic operations like addition, subtraction, multiplication, and division. The study utilised statistical techniques such as EFA, CFA, SEM including path analysis to assess the proposed structural relationships among the constructs.

1. **Exploratory Factor Analysis (EFA):** Exploratory factor analysis is applied to identify hidden dimensions that explain patterns of relationships among variables. It explores the possible factors that represent the data without imposing a preconceived structure. In this empirical study, EFA was employed to assess the dimensional structure of reward presence in relation to the three CoI presences within the online learner sample. PCA was conducted to extract the factors, after which varimax rotation was implemented to improve the clarity and interpretability of the factor loadings. EFA allowed for the exploration of how the items grouped together, without a predefined structure, and helped determine the optimal number of latent factors that best explained the correlations within the dataset.
2. **Confirmatory Factor Analysis (CFA):** CFA, a type of structural equation modelling, evaluates the degree to which observed data conform to a predefined measurement model, thereby assessing the validity of the underlying constructs. In the current study, CFA was used to confirm the factor structure of the reward presence scale as well as teaching, social, and cognitive presence among online learners. CFA was used to assess the model fit and confirm whether the data adequately represented the hypothesized measurement model based on theoretical expectations.
3. **Path Analysis:** Path analysis can be conceptualized as an advanced form of multiple regression that allows researchers to model interconnected structural

relationships among variables. It illustrates direct and indirect effects through a path diagram. In the present study, path analysis was conducted using AMOS (Analysis of Moment Structures) to examine the direct and indirect relationships among the variables of reward presence and teaching presence, social presence, cognitive presence, learning presence, and emotional presence, and their impact on learning outcomes among online learners. This technique enabled the testing of a hypothesised model that specifies causal links between the variables, allowing for insights into both the robustness and command of association. The model fit was assessed employing indices such as CFI, RMSEA, and SRMR to ensure the adequacy of the model.

3.8 Structural Equation Modelling (SEM)

SEM is known as a multivariate analytical approach that includes dimensions of factor analysis and regression analysis to simultaneously assess measurement models and structural relationships among observed indicators and latent variables. SEM helps to evaluate theoretical models and their fit with the observed data. In this study, SEM was applied to measure the hypothesised relationships of reward presence and teaching presence, social presence, and cognitive presence and their effect on learning outcomes among online learners. SEM allowed for the examination of complex relationships, including both direct and indirect effects, while simultaneously estimating multiple equations. The model fit was assessed using key indices such as chi-square, CFI, RMSEA, and SRMR to ensure the adequacy of the model and to confirm that the data aligned with the proposed theoretical framework. The SEM was performed using AMOS software.

Prior to testing the structural relationships, the measurement model of the CoI presences: teaching presence, social presence, and cognitive presence was validated using CFA. Reward presence was specified as a latent construct measured by multiple observed indicators grounded in motivational regulation theory. All constructs were measured using validated scale items, with error terms specified for each observed variable. Construct validity was assessed using standardized factor loadings, composite reliability, and convergent and discriminant validity. One factor loading per latent construct was fixed to unity to establish the measurement scale.

Following validation of the measurement model, a structural model was specified to examine the relationships between reward presence and the three CoI presences: teaching presence, social presence, and cognitive presence. Drawing from the study's objectives, reward presence was proposed to directly or indirectly relate to teaching, social, and cognitive presences within the CoI framework. The model further examined whether reward presence could function as an additional presence within the CoI framework by integrating it with the established presences in a single SEM model.

Model identification was ensured prior to estimation. Figure two and three illustrates the specified SEM model used for identification and estimation. All latent constructs were measured using multiple indicators, and one factor loading per construct was fixed to set the measurement scale. The proposed model was over-identified with positive degrees of freedom, allowing for parameter estimation and model fit evaluation.

The proposed model was analysed using the Maximum Likelihood (ML) estimation technique in IBM SPSS AMOS. The study assessed the adequacy of the suggested model in representing the observed data, for which several goodness-of-fit measures were examined, namely the chi-square (χ^2) statistic, CFI, TLI, RMSEA, and SRMR, to ensure a comprehensive assessment of both absolute and incremental model fit. Hypotheses were tested by estimating the directional influence of reward presence across the three dimensions of CoI presences (teaching, social & cognitive). Overall model fit was used to assess whether reward presence could be supported as an additional presence within the CoI framework.

Figure 3.3: Structural equation model specification for hypotheses H_1-H_3

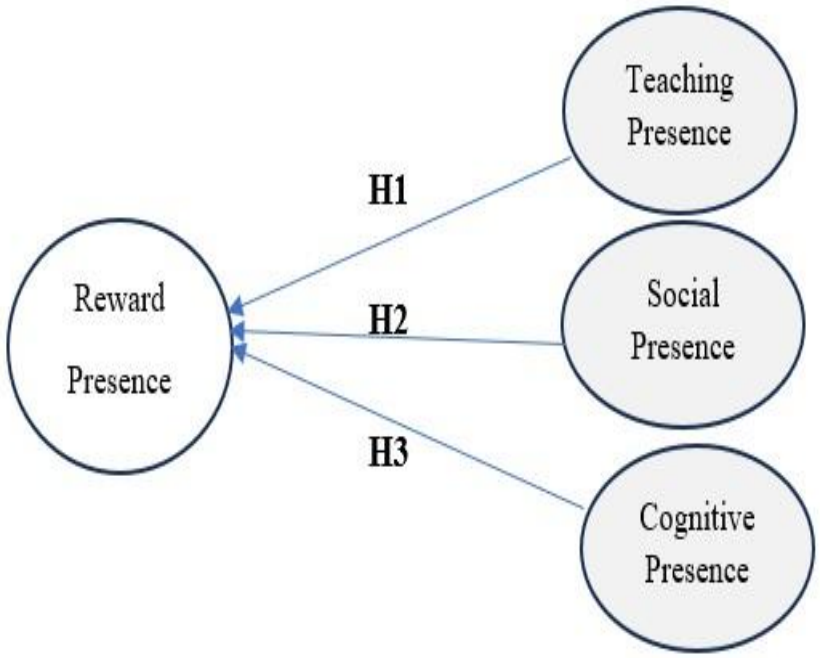
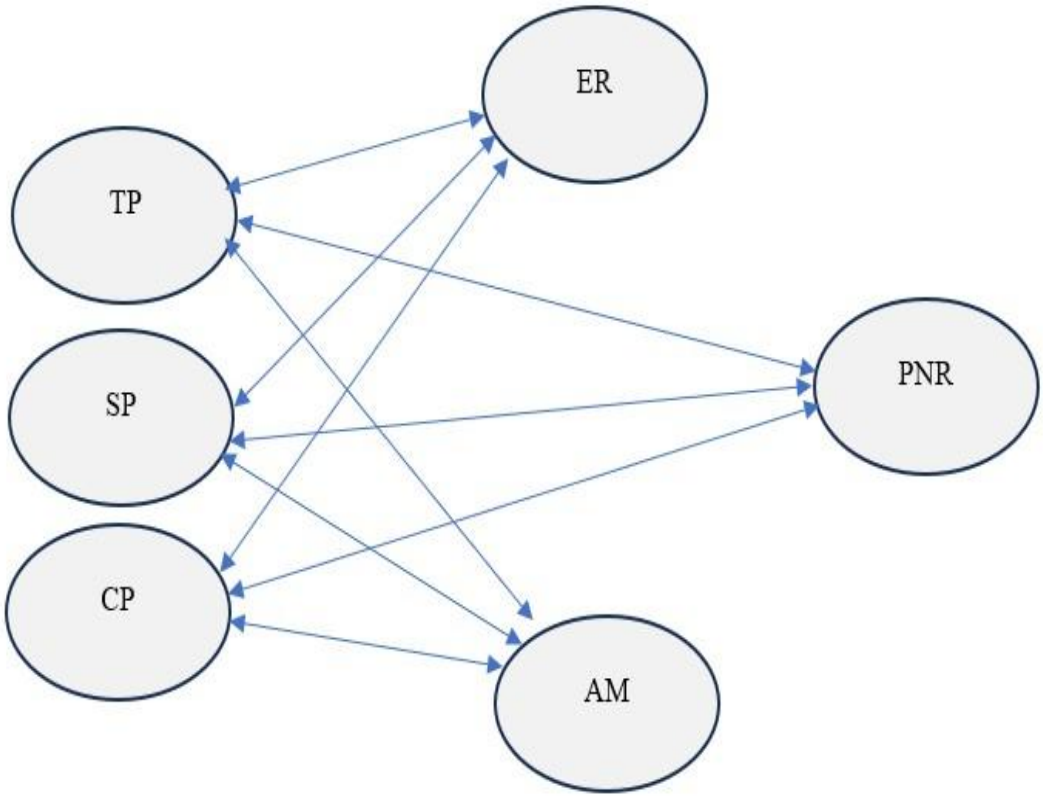


Figure 3.4: Structural equation model specification for hypothesis H_4



3.9 Methodological Table

The data were analysed in accordance with the stated objectives, and the process is outlined in the table below.

Table 3.2: Methodological table based on the chosen objectives and the process

Objectives	Type of data	Tools of data collection	Statistical techniques used for data analysis
To assess the significance of rewards in enhancing engagement and motivational dynamics in an online learning environment	Qualitative	Semi-structured Interview	Thematic Analysis (Qualitative Data Analysis Method)
To develop and validate a reward presence tool by conducting exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).	Quantitative	Reward Presence Tool Construction	EFA & CFA
To validate the community of inquiry (CoI) scale (teaching, social, and cognitive presences) through CFA.	Quantitative	Community of Inquiry Scale and Reward Presence Scale	Confirmatory Factor Analysis
To assess the relationship of reward presence with cognitive, social, and teaching presences within the community of inquiry model.	Quantitative	Reward Presence Scale & CoI Scale	Path Analysis and Structural Equation Modelling
To test whether reward presence functions as an additional presence in the CoI model by integrating it with teaching, social, and cognitive presences using SEM	Quantitative		Structural Equation Modelling

CHAPTER - IV

RESULTS AND FINDINGS

Chapter-IV
Results and Findings

4.1 Introduction

The objective of this study was to extend the community of inquiry framework by incorporating the role of reward presence as a motivational factor. An exploratory sequential mixed-methods design was employed, comprising two consecutive phases: first, a qualitative phase aimed at exploration and theme development, followed by a quantitative phase for empirical testing and validation.

During the first (qualitative) phase of the study, data were collected through semi-structured interviews with 20 participants engaged in online learning platforms. This phase aimed to explore learners' in-depth perspectives on motivation and the role of rewards in sustaining engagement in online learning environments. The themes emerging from these interviews provided valuable insights into learner needs, informing the development of the quantitative instrument and theoretical model.

Based on the qualitative findings, a new construct, 'reward presence' was conceptualised and integrated into the well-recognised CoI framework. The quantitative phase applied a descriptive survey research design and utilised structural equation modelling (SEM) to empirically validate the revised CoI model. This allowed for the examination of the relationships between the traditional CoI presences (teaching, social, and cognitive) and the newly introduced reward presence.

4.2 Qualitative Data Analysis and Results (Phase I)

The role of rewards as motivation in online learning platforms has become an urgent need for cognitive and social interaction in any online learning community. The recent works on gamification and rewards have extensively realised the necessity of motivation in online learning. Therefore, the thesis broadly explored the role and importance of rewards within the learner community, examining how learners perceive the role of motivation through gamification or rewards for the better enhancement of online learning.

Research Objective

In order to answer the first objective of the thesis, the investigator analyses the results of the semi-structured interview that was conducted with a sample of twenty students enrolled in online courses.

1. To explore the significance of rewards in enhancing engagement and motivation in an online learning environment.

Thematic Analysis

Braun and Clarke's (2006) thematic analysis was employed in this study to explore and understand the role of motivation as a regulating factor for learner engagement and participation, making it ideal for exploring new areas and collecting insights from the participants (Braun et al., 2006). Guided by the researcher's theoretical framework, this study used questionnaires and applied Braun and Clarke's six-stage inductive thematic analysis to determine the nature of theme identification. Braun and Clare's (2006) six-step thematic analysis procedure is: a) data familiarity, b) initial codes, c) initial themes, d) theme review, e) define themes, f) write the findings (Braun et al., 2006).

The data were collected from twenty participants from Osmania University and Maulana Azad National Urdu University (MANUU), Hyderabad, in the district of Telangana State. The interviewer asked participants semi-structured questions developed based on the research objectives and modified them as needed during the interview. The interview questions were developed through continuous review and refinement in consultation with the research supervisor. A total of eleven questions were constructed based on the identified themes and aligned with the research objectives.

Table 4.1: Describing the theme and interview question of the study

Theme	Interview Questions
Motivation and Engagement	• Describe your level of motivation • Reward improves the lack of motivation • Personal experience of getting rewards
Role and Types of Reward	• Why rewards are an important factor • Types of rewards you have received • What are the different reward types • Meaningful and motivating reward types

Extrinsic and Intrinsic Motivation	• Rewards for extrinsic and intrinsic motivation • Rewards as an integral part of Online learning • Other factors, apart from reward, motivate learners • Rewards for balancing extrinsic and intrinsic motivation

The results reveal qualitative inquiry, and thematic explanations are supported with both thematic maps and illustrative participant quotations. This dual approach ensures a rich and coherent presentation of findings, enabling readers to trace the analytical process and interpretative depth behind each theme.

Wherever feasible, direct quotations are used for the authenticity of participants' voices. In cases where clarity is necessary, in-text quotations are employed. All participants are referred to by their assigned participant numbers (P1, P2). This helps to enhance clarity and enhance the research process. This approach was discussed and approved by the research supervisor.

Participants Brief Profile

To help understand the results and the findings, the profile of the participants were given.

Table 4.2: Profile of the participants

Online Courses	Numbers	Percentage	Participant
MOOCs, NPTEL	5	25 %	P1, P9, 12, P15, P19
Zoom Class, Coursera	9	45 %	P2, P5, P6, P7, P8, P11, P14, P16, P17
Others	6	30%	P3, P4, P10, P13, P18, P20

Overview of the Themes, Sub-themes and Codes

Three main themes were chosen for the qualitative thematic analysis. Each theme has sub-themes that represent the participants' insights according to the constructed questions. The overview of the themes is represented in the Table below:

Table 4.3: Overview of the theme

Theme	Question
Theme 1: Learner motivation and influencing factors	Q1-Q2
Theme 2: Perception and value of rewards	Q3-Q7
Theme 3: Reward and the nature of motivation	Q8-Q11

After the sub-themes, the investigator analysed the data to integrate the themes and sub-themes into codes. The codes are the labels of assigned specific segments of the data, which may include a sentence, phrase or idea. At the same time, a limited number of illustrative quotes were presented for each theme to maintain the analytic depth of the study. Each code is described alongside its corresponding theme and sub-theme to understand its meaning, as presented below.

Table 4.4: Theme, sub-theme and codes of the thematic analysis

Theme	Sub-theme	Codes
1. Learner Motivation and Influencing Factors	1.1 Baseline Motivation for Online Learning	Passion for subject - Career growth - Need to earn certificates - Personal development goals - Job-oriented motivation
	1.2 Demotivating Factors	Lack of instructor response - Monotonous content - Technical challenges - Feeling isolated - Poor course design
	1.3 Motivation Enhancement via Rewards	Rewards as motivators during low phase - Push from expected certification - Anticipation of recognition - Extrinsic reinforcement during fatigue
2. Perception and Value of Rewards	2.1 Personal Experiences with Rewards	Joy on receiving certificates - Psychological boost from being acknowledged - First-time reward impact stories
	2.2 Preferred Types of Rewards	Certificates as proof of achievement - Scholarship as strong incentive - Mixed views on badges (some like, some ignore) - Prefer tangible benefits over digital symbols - Prefer credit points, leaderboard for inspiring mind - Prefer instructor's feedback to boost encouragement - Motivated while interacting with peers - engaging while receiving gift coupon

	2.3 Suggested Innovations	Introduce micro-scholarships - Offer real-time reward points - Use credits for internships/jobs
3. Rewards and the Nature of Motivation	3.1 Intrinsic vs. Extrinsic Influence	"I learn for self-growth" vs "I learn for rewards" - Rewards help build confidence, then fade - Intrinsic curiosity develops after extrinsic motivation - Dual motivation pathways exist
	3.2 Integrating Rewards in Learning Process	Small rewards after each milestone - Gamified progress tracking - Motivation through gradual incentives - Meaningful reward stages aligned with learning goals
	3.3 Other Motivational Approaches	Real-world examples enhance engagement - Interactive, responsive teachers - Peer presence creates accountability - Role of social learning in motivation
	3.4 Balancing Both Motivational Types	Combine emotional satisfaction with certification - Motivation = personal relevance + tangible outcome - Rewards that reinforce internal learning values - Need balance: not reward-only, not content-only

4.2.1: Theme 1: Learner Motivation and Influencing Factors

This theme explains the wide scope of motivational dynamics that influence learners' engagement in online learning environments. Participants revealed that their motivation is influenced by a combination of personal goals, systemic barriers, and the presence (or absence) of rewards. These insights are organised under three sub-themes as mentioned in the Table 4.4.

Baseline Motivation for Online Learning

Participants highlighted intrinsic and goal-oriented reasons for enrolling in online courses. These include a deep passion for particular subjects, the desire to grow professionally, and specific aspirations such as earning certificates for career advancement or self-development.

"I choose online learning to enhance my career, and also because I love the subject." (P3)

"I want certificates so I can show them during interviews or apply for better opportunities." (P7)

"Online courses help me become more confident and grow as a person." (P11)

"I joined online courses mainly to upgrade my skills so I can perform better in my profession, but I also enjoy learning new concepts." (P5)

These responses reflect a collection of internal motivation (e.g., passion, personal growth) and external motivation (e.g., job credentials, career goals). Even though motivations are diverse, they are clearly connected with learners' career goals and perspectives.

Demotivating Factors

Despite strong initial motivation, several participants described specific elements of the online learning experience that lacked their engagement over time. These demotivating factors include:

- Lack of faculty response: Participants felt ignored or disconnected when instructors failed to acknowledge them or provide timely feedback.
- Monotonous content: Repetitive or course materials made learners feel dis-engaged.
- Technical difficulties: Poor platform performance or unstable internet discouraged consistent participation.
- Feeling isolated: Absence of peer interaction or community created a sense of loneliness.
- Poor course design & overload: Courses that were unstructured or too demanding overwhelmed learners.

"There is no interaction with the teacher… that makes me lose interest." (P11)

"Too many assignments and classes make it boring and tiring." (P8)

"When there is no feedback, I feel like no one cares if I learn or not." (P4)

"Most of the time, the instructor does not respond, so I feel disconnected and stop paying attention." (P6)

"The content is mostly long readings, and after some time, it becomes monotonous and difficult to stay engaged." (P10)

These barriers suggest that even highly motivated learners can lose momentum if the design, delivery, or interpersonal aspects of a course are weak.

Motivation Enhancement via Rewards

Participants described how rewards acted as motivational triggers, especially when their enthusiasm dropped. Certificates, badges, recognition, and the anticipation of completing a course served as incentives that helped learners push through fatigue or disinterest.

"Sometimes, I do not feel like continuing, but then I think about the certificate, and I get back to it." (P5)

"I wanted recognition, when I got it, I felt proud and wanted to continue more courses." (P2)

"These rewards help when the topic is hard or when I feel too tired to continue." (P9)

This indicates that rewards work as an extrinsic motivator, improve engagement during low levels of motivation. Importantly, these rewards do not replace intrinsic drive but instead enhance it by providing tangible rewards.

Learners come into online education with strong personal and professional motivations. However, sustaining motivation requires more than initial interest; it depends highly on the design and interaction of the course. Demotivating factors such as poor faculty engagement and isolation decrease the most determined learners also. In this context, rewards act as meaningful extrinsic motivators, especially when learners are not motivated internally. They serve to reinforce persistence and offer learners a sense of progress and achievement.

4.2.2 Theme 2: Perception and Value of Rewards

This theme describes how online learners perceive the role and importance of rewards, the types of rewards they value most, and their suggestions for how reward systems can be improved. Drawing from direct experiences, participants reflected on both emotional influence and practical expectations, particularly in the context of their online learning paths.

Personal Experience with Rewards

For many participants, rewards were more than just virtual tokens; they carried emotional and symbolic meaning. Several learners reported feeling a strong sense of recognition when rewarded during online learning, particularly during the COVID-19 period when physical classrooms were inaccessible.

"During COVID, I felt alone, but when I completed that course and got the certificate, it felt like I did something good." (P1)

"When I received my first online badge, I showed it to my family. It felt like someone saw my hard work." (P6)

"Before that, I never got any kind of reward. That certificate from NPTEL really gave me a boost." (P9)

A few participants shared those first-time experiences with rewards left a lasting emotional impression, reinforcing their sense of ability and accomplishment. These responses suggest that rewards, when combined to personal achievement, function as psychological enhancer, especially in self-paced environments where external validation is otherwise very low.

Preferred Type of Rewards

While participants appreciated certificates and badges, their perceptions of value varied. Most learners valued certificates highly because they acted as proof of achievement that could be shown to employers, added to CVs, or used for academic progression.

"I save all my certificates. They are proof that I spent time and effort on something useful." (P3)

Four to five participants' responses on various types of rewards, tangible and non-tangible, some participants emphasised scholarships or financial support as powerful motivators. These were not only seen as tangible benefits but also symbolic recognition of merit and need

"Scholarships make a huge difference. For students from poor backgrounds like me, it's not just money; it means someone believes in you." (P8)

"Badges are fun, but after a while I stopped caring. If they don't count for anything, what's the point?" (P5)

"I like badges when they show levels, like beginner to advanced, then it makes sense." (P10)

However, opinions on badges were mixed. Some learners found them encouraging, especially when used as milestones, while others dismissed them as superficial. Overall, tangible rewards that offered career, academic, or financial value were seen as more meaningful than symbolic digital tokens.

Suggested Innovations

Participants expressed a strong interest in improving the way rewards are implemented in online learning. Many suggested more dynamic and performance-linked systems, such as micro-scholarships, real-time reward points, or internship credits based on active participation. A few learners emphasised that rewards should be linked to genuine effort, rather than just course completion.

"Even small scholarships can motivate students like me." (P11)
"What if we earned points during each week and could redeem them? That would make it more engaging." (P19)
"Sometimes people just click 'next' and get the certificate. There should be more effort-based rewards, like for completing quizzes or helping others." (P17)

These suggestions point to a desire for fair, transparent, and more personalised reward mechanisms that acknowledge both progress and process, not just end results.

Overall, in theme two, participants valued rewards that acknowledged their effort, especially when those rewards had real-world value. While certificates remain the most widely appreciated form, there's growing interest in micro-rewards (e.g., points, credits, scholarships) that can be redeemed or linked to career opportunities. Badges were seen as useful by some but lacking substance by others, reinforcing the need for multi-layered reward strategies that balance emotional encouragement with practical incentives.

4.2.3 Theme 3: Reward and the Nature of Motivation

This theme examines how learners experience and balance extrinsic rewards and intrinsic drives during their online learning settings. Participants acknowledged that while rewards often initiate engagement, deeper learning emerges when emotional, cognitive, and social needs are met over time. This theme also captures learners' recommendations for better motivational design and highlights the fine line between meaningful reward and over-reliance on external incentives.

Extrinsic vs. Intrinsic

Participants provided thoughtful reflections on what motivates them. While some identified as intrinsically driven, motivated by curiosity or self-growth and others admitted that external rewards triggered their initial participation.

"I started the course just to get the certificate. But once I went into the topics, I really enjoyed it." (P16)

"At first, I wanted the badge. But later, it became more about completing the project well." (P2)

"I feel, without external reward in the beginning, I might have dropped out. But later, I liked learning on my own." (P13)

Some participants noted that rewards served as training wheels, helping them stay engaged until intrinsic motivation could take over. This inter-connection between extrinsic and intrinsic mechanism, starting with extrinsic goals, transitioning into intrinsic engagement, was a repetitive theme across interviews.

Integrating Rewards in Learning

In this sub-theme, learners proposed that reward systems should be put together into the learning process rather than being placed only at the end. Several participants preferred smaller, milestone-based rewards, which helped them track progress and maintain momentum.

"It's better if they give small rewards, like after finishing a module or quiz. That way we feel like continuing." (P3)

"Gamification is good when it matches learning. Not just for fun, but to keep us active." (P5)

Gamified structures such as visual progress bars, stages, or point systems were considered engaging, especially when these rewards were aligned with meaningful learning outcomes. Such reward systems, when tied to clear learning goals, were described as both motivating and informative.

Other Motivational Approach

In this sub-theme, participants highlighted the importance of interactive teaching and peer presence than the necessity of rewards. Many described real-world applications and relatable examples that motivate them while learning.

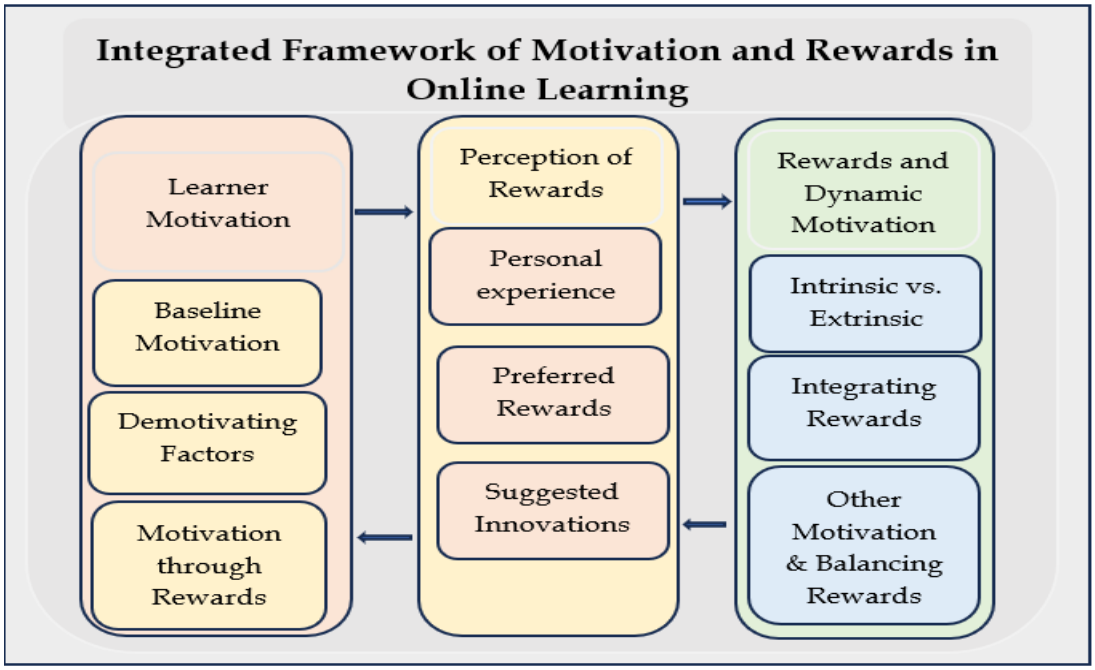
"When teachers give real examples like job-related or life-related, it makes me feel connected." (P7)

"When I see others doing well, I push myself too." (P18)

"Peer learning makes me feel part of something. Otherwise, it's very lonely." (P20)

Participants also emphasised that social elements in learning, such as peer interaction, group assignments, or leaderboard-based accountability that enhanced their engagement. This indicates that community and context can reinforce or even replace extrinsic motivators.

Figure 4.1: Integrated framework of motivation and rewards in online learning



Balancing Motivational Types

A significant insight emerged around the need to balance extrinsic motivators with intrinsic satisfaction. Some learners valued both equally: the emotional joy of learning and the tangible payoff of a certificate. Several participants agreed that the combination of content relevance and outcome relevance created the most powerful motivation.

"It's satisfying when you enjoy the subject and also have something to show for it." (P10)

"When the topic connects with my life and also gives me a benefit, then I feel fully motivated." (P11)

While explaining the influencing factors of rewards, there was also a clear caution among learners: too much emphasis on rewards could make them lose sight of real learning, while a complete lack of recognition led to disengagement. Hence, a balanced model, one that respects internal growth while acknowledging effort externally, was preferred.

The overall integration of motivation regulating rewards, as identified through the qualitative thematic analysis, is illustrated in the diagram 4.1. Phase I reveals the necessity of introducing various elements of rewards, such as gamification and psychological rewards, to design a learning experience that fulfils learners' cognitive, social, and emotional needs and motivates them to learn online without fail.

4.3 Foundation for Reward Presence Scale Development

The insights from this qualitative study provide a critical foundation for the next phase of research, which involves conceptualising and developing a reward presence scale as the fourth dimension of the community of inquiry (CoI) framework. Through in-depth narratives from the twenty participants, this study explored how rewards shape learner motivation, influence engagement patterns, and interact with both intrinsic and extrinsic motivational systems. Importantly, the themes that emerged encompass learners' baseline motivation, their perceptions of different types of rewards, and how rewards integrate into their overall learning experiences, revealing that reward systems are not merely supplemental in online learning; they are structurally influential and psychologically meaningful.

Participants consistently described how rewards served as a motivational factor during periods of disengagement, enhanced their emotional connection to learning, and fostered a sense of progress, recognition, and purpose. This aligns with the self-determination theory, where external and internal motivators like reward and gamification, structured well, can improve internal motivation and sustained learner autonomy. Such findings suggest that the existing CoI model, which focuses on teaching presence, social presence, and cognitive presence, may not be fully responsible for the motivational needs that support learner persistence and satisfaction in online environments. The concept of reward presence emerges from this gap as a distinct yet interrelated presence that represents how reward mechanisms (both external and internal) influence knowledge building, decision-making, collaboration, and progression in an online course.

The phase II scale development is conceptually based on the qualitative themes. The items that can be directly converted into quantifiable constructs include external regulation, introjected regulation, identified regulation, integrated regulation, intrinsic motivation, and basic psychological needs: and autonomy, competence and relatedness.

In the next stage, exploratory and confirmatory factor analysis will be used to validate the reward presence scale. Sequentially, EFA and CFA are chosen to measure the accuracy of the community of inquiry model, followed by the application of structural equation modelling to analyse the relationship between reward presence and the community of inquiry presences, defined as observed variable and latent variable, by testing the hypothesised model. Therefore, this qualitative phase strategically guides the construction of the reward presence scale for the community of inquiry model, which reflects learners' actual experiences in online learning settings, while also providing a rich contextual understanding.

4.4 Quantitative Data Analysis and Results (Phase II)

This thesis aims to advance the CoI model by introducing reward presence as a novel construct, placing it as a motivational factor to enhance meaningful learning experiences in online learning. The reward presence has the potential to enhance instructional design and teaching strategies within the online CoI framework. By analysing the relationship of reward with CoI framework, the study seeks to provide meaningful insights into how motivation can foster effective online learning experiences.

Research Objectives

The study aimed to address the following objectives for the phase II analysis. It studies the relationship between the CoI presence and the relationship between the newly developed scale of reward presence and CoI presences.

2. To develop and validate a reward presence scale by conducting exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).
3. To validate the measurement model of the CoI presences (cognitive, social and teaching presence) through CFA.
4. To examine the relationship between reward presence and cognitive, social, and teaching presences of the community of inquiry model.
5. To test whether reward presence functions as an additional presence in the CoI model by integrating it with cognitive, social and teaching presence in a structural equation model.

Research Hypotheses

To address the research objectives, this study formulated two primary hypotheses based on the conceptual framework and literature review. These hypotheses aim to explore the relationship between reward presence and various presences of the CoI model, along with other relevant presences in the learning environment. The hypotheses are stated as follows:

H_{01}: There exists no statistically significant relationship between reward presence and teaching presence.

H_{02}: There exists no statistically significant relationship between reward presence and social presence.

H_{03}: There exists no statistically significant relationship between reward presence and cognitive presence.

H_{04}: There exists no statistically significant improvement in model fit with the inclusion of reward presence as an additional presence in the community of inquiry framework.

4.4.1 Descriptive Statistics

This section presents the demographic profile of the respondents, including gender, age, and educational background. The information was summarised using frequencies and percentages. The participants for the quantitative analysis were 722 students enrolled in bachelor's, master's, Ph.D., and other courses in higher educational institutions. The participants were also engaged with online platforms according to their time preferences.

Profile of the Respondents

Gender of the Participants

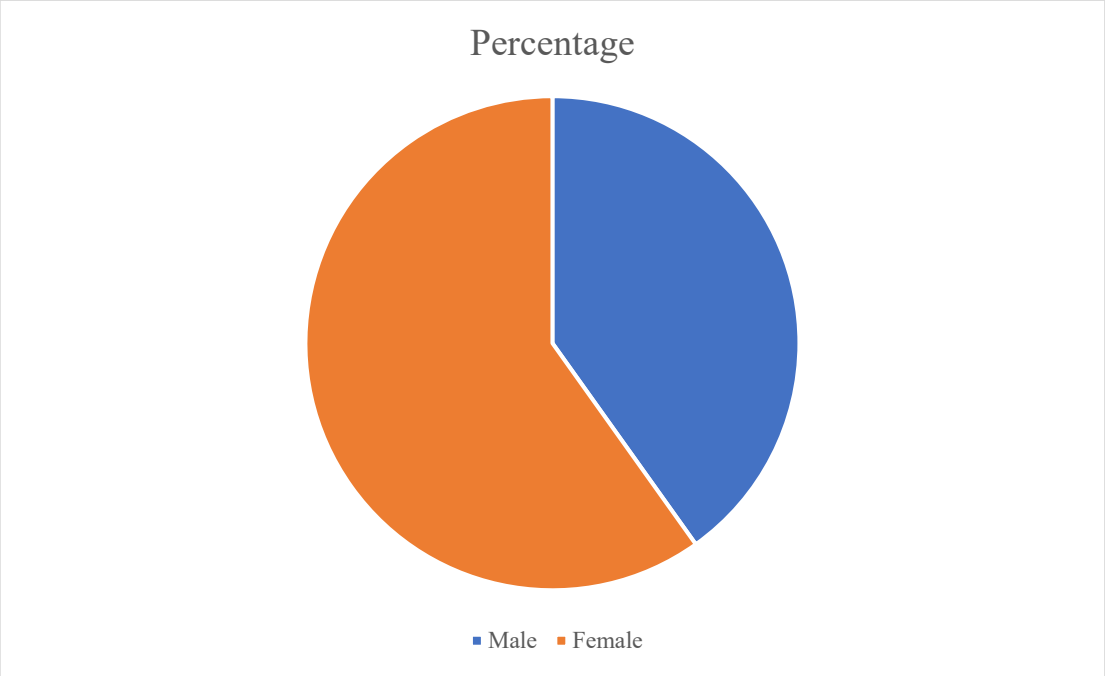
The study included a total of 722 online learners enrolled in Indian higher education institutions. Of these, 290 participants (40.1%) were male and 432 participants (59.8%) were female. Data were collected through both online and offline surveys.

Table 4.5: Percentage-wise tabulation of gender enrolled in online learning courses

Gender	Frequency (n)	Percentage %
Male	290	40.1%
Female	432	59.8%

The corresponding percentages from the above table are illustrated in the following pie chart.

Figure 4.2: Pie chart showing the percentage of gender enrolled in online courses



Educational Background

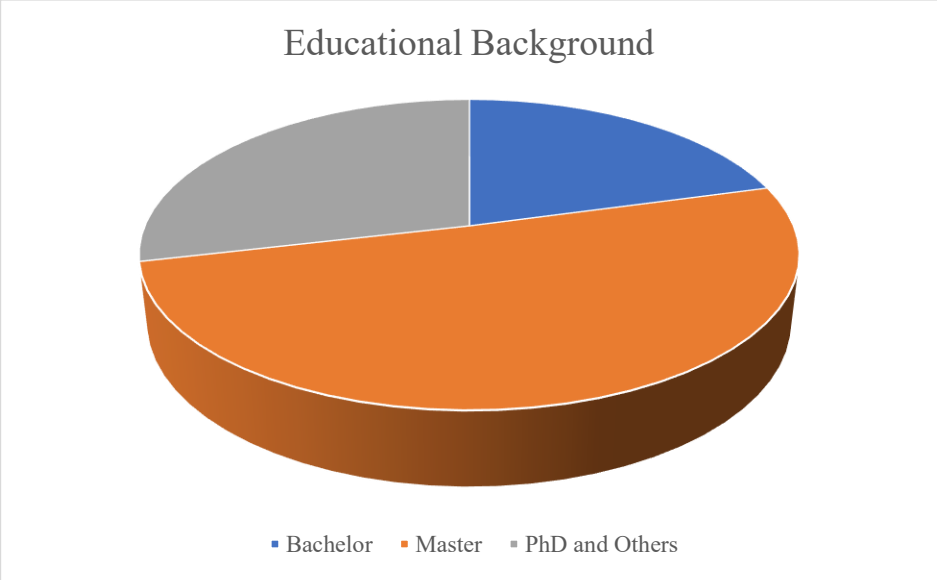
Table 4.6 presents the distribution of participants according to their educational background. The majority of respondents were master's degree holders, accounting for 365 participants (50.5%). This was followed by Ph.D. holders and others (including postgraduate diplomas and professional qualifications), comprising 207 participants (28.6%). The smallest group were bachelor's degree holders, with 150 participants (20.7%). These results suggest that online learning courses in the sample were predominantly attended by learners with advanced academic qualifications, particularly those at the postgraduate level.

Table 4.6: Percentage-wise tabulation of the educational background of the participants enrolled in online learning courses

Educational Background	Frequency (n)	Percentage %
Bachelor	150	20.7%
Master	365	50.5%
Ph.D. and Others	207	28.6%

Based on the above table, the percentages are shown in the pie chart as follows:

Figure 4.3: Pie chart showing the percentage of educational background of learners enrolled in online courses



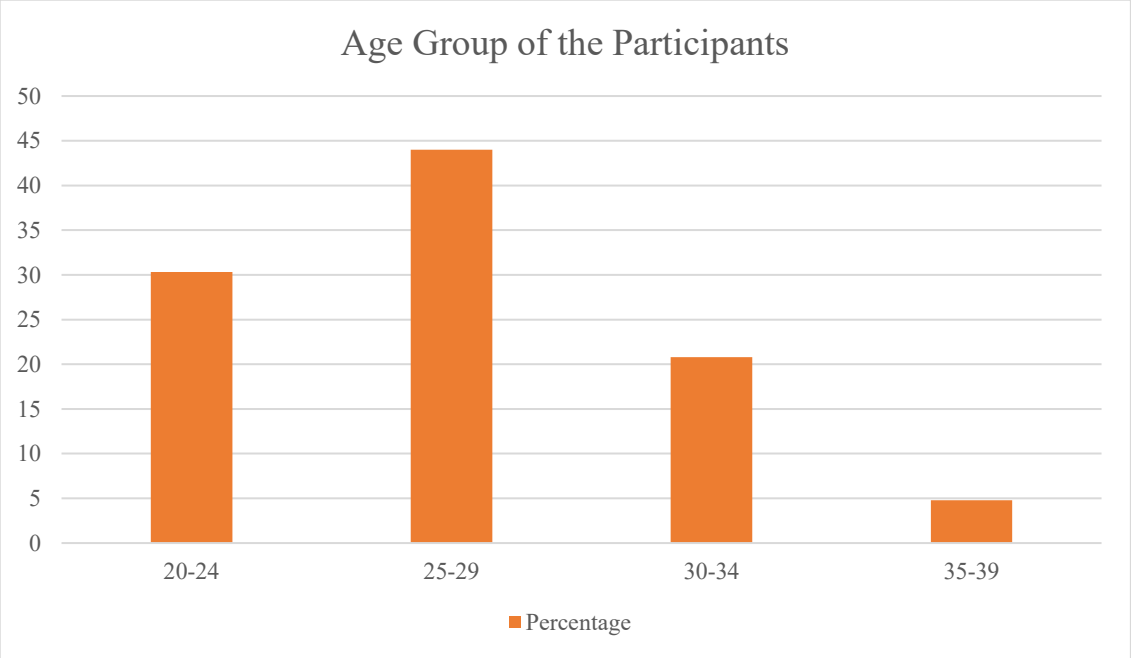
Age of the participants

The participants' ages were grouped into four categories, ranging from 20-24 years to 35-39 years. As shown in Table 4.7, the largest proportion of participants belonged to the 25-29 age group, with 318 individuals (44.0%). This was followed by the 20-24 age group, with 219 participants (30.3%). The 30-34 age group comprised 150 participants (20.8%), while the 35-39 age group had the smallest representation, with 35 participants (4.8%). These findings indicate that the majority of learners enrolled in online courses were in their twenties, suggesting that online learning platforms are most popular among young adults in higher education.

Table 4.7: Percentage-wise tabulation of the age group of the participants enrolled in online learning courses

Age group	Frequency (n)	Percentage %
20-24	219	30.3%
25-29	318	44 %
30-34	150	20.8%
35-39	35	4.8%

Figure 4.4: Bar chart showing the percentage of age group of learners enrolled in online courses



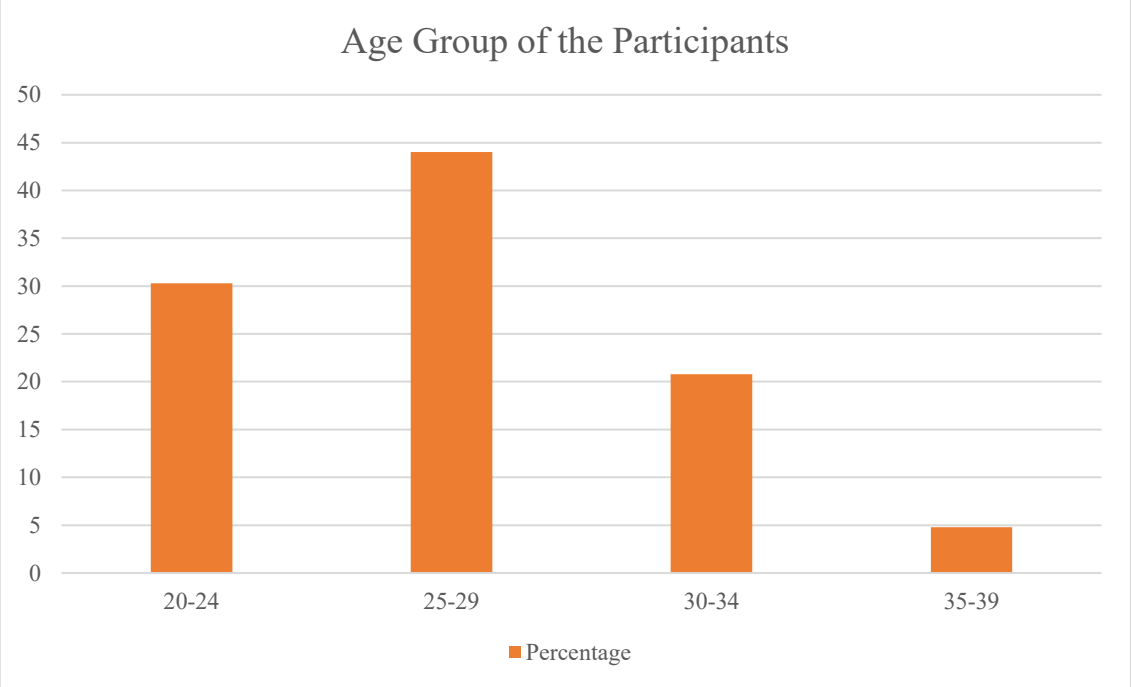
Online Learning Platforms used by Participants

Table 4.8 presents the distribution of participants according to the online learning platforms they used. The results indicate that Coursera was the most frequently used platform, with 284 participants (39.3%) reporting its use. This was followed by SWAYAM, used by 244 participants (33.8%), and NPTEL, used by 102 participants (14.1%). A further 92 participants (12.7%) reported using other platforms, such as edX, Udemy, and Khan Academy. These findings suggest that Coursera and SWAYAM are the dominant platforms among the surveyed learners, reflecting both global and national trends in online learning adoption.

Table 4.8: Percentage-wise tabulation of online learning platforms used by the participants enrolled in online learning courses

Online Learning Platforms	Frequency (n)	Percentage %
Coursera	284	39.3%
SWAYAM	244	33.8%
NPTEL	102	14.4%
Others	92	12.7%

Figure 4.5: Bar chart showing the percentage of online learning platforms learners used for learning



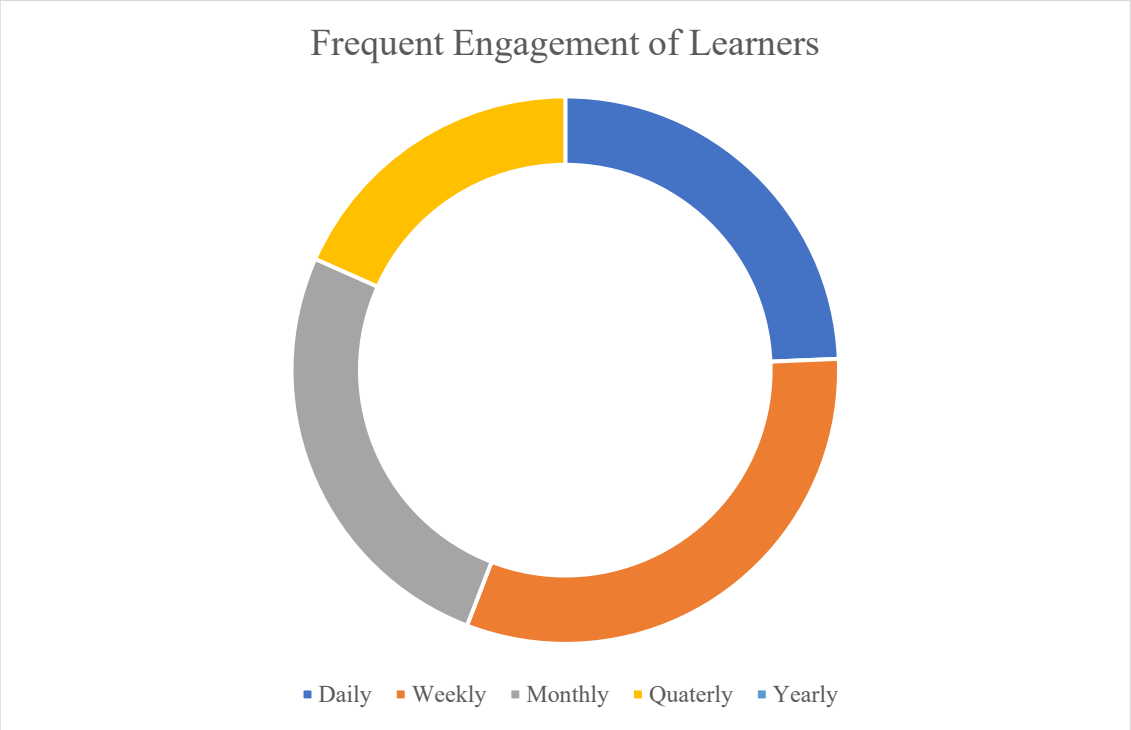
Frequency of using online platforms

Table 4.9 presents the distribution of participants based on the frequency of their engagement with online learning platforms. The highest proportion was reported engaging on a weekly basis (29.9%), followed by monthly engagement (24.5%) and daily participation in online courses (23.1%). Quarterly engagement accounted for 17.4%, while the lowest level of engagement was observed annually, at 4.9%.

Table 4.9: Percentage-wise tabulation of the frequency of using online platforms of the participants enrolled in online learning courses

Frequent Engagement	Frequency (n)	Percentage %
Daily	167	23.1%
Weekly	216	29.9%
Monthly	177	24.5%
Quarterly	126	17.4%
Yearly	36	4.9%

4.6: Pie chart showing the percentage of frequent engagement of learners



4.4.2 Descriptive Statistics of Study Variables

The total sample (N = 722) was randomly divided into two split-half samples using the Statistical Package for the Social Sciences (SPSS, version 21), with 361 participants allocated for exploratory factor analysis (EFA) and 361 participants allocated for confirmatory factor analysis (CFA).

Table 4.10 presents the descriptive statistics for all major constructs used in the study. The mean scores indicate the general level of agreement or presence for each construct among participants. External motivation (M = 51.70, SD = 5.37), intrinsic

motivation (M = 48.01, SD = 5.85), and basic psychological needs (M = 47.68, SD = 5.35) recorded moderately high means, suggesting that learners generally experienced both forms of motivation and felt their psychological needs were being met in the online learning environment.

Among the CoI dimensions, cognitive presence had the highest mean (M = 52.66, SD = 3.80), followed by social presence (M = 48.36, SD = 3.24) and teaching presence (M = 36.01, SD = 4.22). This indicates that learners perceived a relatively stronger cognitive presence compared to teaching facilitation.

4.4.3 Preliminary Data Analysis

Normality

To examine univariate normality, descriptive statistics including skewness and kurtosis were computed for each construct (Table 4.10). Skewness values ranged from –1.797 to 0.006, and kurtosis values ranged from 0.202 to 3.557. These values are within acceptable thresholds (–2 to +2 for skewness and –7 to +7 for kurtosis; (Byrne, 2013; Kline, 2018), indicating that the data approximate a normal distribution. Therefore, the assumption of univariate normality was satisfied, supporting the use of maximum likelihood estimation for CFA and SEM.

Table 4.10: The results of the descriptive statistics of survey dimensions

Measure	Items	Mean	SD	Skewness	Std. error of skewness	Kurtosis	Std. error of kurtosis
External Motivation	12	51.70	5.372	-1.344	.091	2.476	.182
Intrinsic Motivation	13	48.01	5.852	-1.298	.091	2.670	.182
Basic Psychological Needs	12	47.68	5.345	-1.797	.091	3.557	.182
Teaching Presence	13	36.01	4.217	-.187	.091	.766	.182
Social Presence	9	48.36	3.242	-.326	.091	1.213	.182
Cognitive Presence	12	52.66	3.804	.006	.091	.202	.182

Reliability

Table 4.11 reports the internal consistency reliability of the reward presence scale and its three sub-dimensions: external motivation, intrinsic motivation, and basic psychological needs. Cronbach's alpha values for these dimensions ranged from .698 to .757, indicating acceptable internal consistency ($\alpha > .60$) for research purposes.

The overall Cronbach's alpha for the entire reward presence scale was .877, which exceeds the recommended threshold of .70 (George & Mallery, 2024), demonstrating good reliability of the scale. These results suggest that the items within each subscale were measuring their respective constructs consistently.

Table 4.11: The reliability of the reward presence scale

Dimension	Cronbach's Alpha	Mean	Variance	Std. Deviation	No. of Items
External Motivation	0.734	47.68	28.862	5.372	10
Intrinsic Motivation	0.757	51.70	34.240	5.852	12
Basic Psychological Needs	0.698	48.01	28.566	5.345	14
Total	0.877	147.38	204.06	14.285	36

Table 4.12 presents the reliability coefficients for the community of inquiry (CoI) scale. Cronbach's alpha values for teaching presence (.611), social presence (.513), and cognitive presence (.534) indicate modest internal consistency, which may be attributed to contextual factors or the instrument's adaptation to the specific online learning environment.

The overall reliability of the CoI scale was .771, which meets the acceptable level for exploratory research. While subscale reliabilities are somewhat lower than typically reported in the literature, the overall scale demonstrates reasonable internal consistency, allowing for further factor analysis and structural modelling in subsequent sections.

Table 4.12: The reliability of the community of inquiry scale

Dimension	Cronbach's Alpha	Mean	Variance	Std. Deviation	No. of Items
Teaching Presence	0.611	52.66	17.786	4.217	13
Social Presence	0.513	36.01	10.508	3.242	9
Cognitive Presence	0.534	48.36	14.470	3.804	12
Total	0.771	137.03	83.027	9.112	34

4.4.4 Developing and Validating the Reward Presence Scale through EFA and CFA

Exploratory Factor Analysis (EFA)

For conducting exploratory factor analysis, the sample size has been taken as 361 with 36 items for the reward presence scale. An initial examination of the correlation matrix indicated that the matrix was not positive definite, suggesting potential multicollinearity among certain items. The Kaiser-Meyer-Olkin (KMO) measure was below the recommended threshold of .50, indicating insufficient common variance among the items. Despite the low KMO, an EFA was conducted using Principal Component Analysis with Varimax rotation. The analysis suggested a seven-factor solution. Items Q1, Q2, Q3, Q5, Q6, Q7, Q10, and Q11 loaded strongly on Factor 1 (>.77), while items Q14, Q15, Q17, Q18, and Q19 defined Factor 2 (>.77). Factor 3 consisted of items Q29-Q36 with weaker loadings (.28–.54). Factor 4 contained items Q4, Q12, Q16, and Q20, though some items (e.g., Q24, Q27) displayed cross-loadings. Factors 5, 6, and 7 were characterised by redundant item pairs (Q13 & Q20, Q8 & Q25, Q9 & Q26) with near-identical loadings (> .93), raising concerns about redundancy. This implies that some variables may share excessive variance, reducing their discriminant ability. Overall, the rotated solution indicated that while several factors demonstrated strong internal consistency, some items may require refinement or removal to reduce redundancy and improve discriminant validity.

Table 4.13: The rotated component matrix

Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
Q10	.855						
Q2	.852						
Q3	.818						
Q6	.814						
Q1	.812						
Q7	.809			.103			
Q5	.802						
Q11	.774						
Q23		.349					
Q18		.840					
Q22		.543	.334				
Q14		.795					
Q19		.791					
Q15		.780					
Q21		.537					
Q17		.777					
Q29			-.125				
Q33			.344				
Q32			.543				
Q31			.279				
Q34			.292				
Q30			.326				
Q36			.127	.122			
Q35			.108	.191	.326		
Q27				.334		.110	
Q24				.235			.174
Q16				.766			
Q12				.809	.280	.235	
Q28			.108	.537		.191	.326

Q20				.938		.127	.
Q13				.938		.127	.122
Q4				.805	.127		
Q8				.948	.160	.	
Q25				.174	.160	.948	
Q26				.177	.123		.956
Q9							.956

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

To address the issue of multicollinearity and cross-loadings, items with extremely high inter-item correlations and those with weak factor loadings were carefully inspected and subsequently removed. Following this refinement, the SPSS dimension extraction process was rerun with the reduced set of items for the reward presence scale. A second round of KMO and Bartlett's tests was then conducted to confirm the adequacy of the data for further factor extraction.

Table 4.14: The reliability of the KMO and bartlett's test of reward presence scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.935
Bartlett's Test of Sphericity	**Approx. Chi-Square**	4771.927
	df	190
	Sig.	.000

The second round of the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was .935, exceeding the recommended threshold of .60 and falling within the *"marvelous"* range (Kaiser, 1974). This indicates that the proportion of variance among variables is sufficiently high to warrant factor analysis. Bartlett's Test of Sphericity was significant, $\chi^2(190) = 4771.93$, $p < .001$, confirming that the correlation matrix was not an identity matrix. Collectively, these results demonstrate that the data were highly suitable for factor extraction.

An EFA was then conducted using principal component analysis with varimax rotation. The rotation converged in three iterations and revealed a clear three-factor solution. Items 9-17 loaded strongly on Factor 1 (>.79), items 01-08 loaded strongly on Factor 2 (>.79), and items 18–20 loaded strongly on Factor 3 (>.79). All factor loadings exceeded the .40 threshold, with the majority above .80, indicating robust item, factor associations. Importantly, no substantial cross-loadings were observed, suggesting good discriminant validity among the factors. After obtaining the rotated component matrix, the items were reorganized according to their serial numbers to provide a clearer and more systematic presentation of the factor structure.

After conducting exploratory factor analysis, the final reward presence scale consisted of 20 items, with cross-loading items removed to achieve an optimal KMO value. The following table presents the items of the scale.

Table 4.15: The factor loading of reward presence scale

Factor Dimension	Item No.	Item Statement	Factor Loading	Factor Loading	Factor Loading
(Psychological Reward) **Autonomy**	1	Earning different types of rewards makes me feel empowered to shape my own learning journey.	.811		
	2	The rewards allow me to choose how to participate in forums, self-assessments, and assignments, giving me a sense of control.	.821		
	3	I feel confident that the gamified rewards let me take ownership of how I engage with the course.	.836		
Competence	4	Earning rewards for assignments makes me feel confident in achieving course objectives.	.837		
	5	Rewards help me feel capable of overcoming obstacles and achieving learning goals.	.839		

	6	Receiving rewards gives me a sense of accomplishment when I perform well.	.795		
Relatedness	7	Sharing rewards (badges, leaderboard ranks) helps me feel connected to my peers.	.829		
	8	Recognition through rewards makes me feel supported and motivated.	.835		
	9	Receiving positive recognition or rewards for my contributions in forums makes me feel valued and respected.	.850		
(Extrinsic Reward) **Performance-based Reward**	10	I enrol in online courses to earn certificates or badges from the portal.		.805	
	11	Seeing my name on the leaderboard motivates me to complete the assignments.		.850	
	12	Earning credit points/virtual avatar boosts my motivation and active participation in this course.		.849	
Material Reward	13	I am more likely to put in extra effort when there is a gift coupon or cash reward for completing an online course.		.823	
	14	The availability of bonus points, gift cards, and stickers influences my decision to take part in online courses.		.797	
	15	A cash prize or gifts motivate me to achieve the targeted objective in online courses.		.844	

Social Reward	16	Receiving praise and recognition from peers motivates me to participate in this course.		.850	
	17	Encouraging feedback from the course instructor energizes my motivation to overcome various challenges during the course.		.847	
Amotivation	18	I don't see the rewards in this course that make the learning worthwhile.			.809
	19	Even with rewards, I often feel there is no point in putting effort into this course.			.793
	20	The rewards do not really motivate me because I don't find value in the course itself.			.840

After conducting the EFA, it was necessary to evaluate the internal consistency of the extracted factors to ensure the reliability of the scale. Accordingly, Cronbach's alpha coefficients were calculated for each factor using the same dataset employed in the EFA (N = 361). The psychological reward factor (9 items) demonstrated excellent reliability, α = .902. The extrinsic reward factor (8 items) also exhibited excellent reliability, α = .937. The amotivation factor (3 items) showed acceptable reliability, α = .749, meeting the minimum recommended threshold of .70 (Nunnally & Bernstein, 1994). Finally, the overall scale (20 items) demonstrated good reliability, α = .866. These results indicate that the scale and its sub-dimensions possess strong internal consistency, suggesting that the items reliably measure their respective constructs.

Table 4.16: The reliability of the reward presence scale

Factor	No. of Items	Cronbach's α
Psychological Reward	9	.902
Extrinsic Reward	8	.937
Amotivation	3	.749
Total Scale	20	.866

Confirmatory Factor Analysis (CFA) of Reward Presence Scale

Following the exploratory factor analysis (EFA), a confirmatory factor analysis (CFA) was conducted using IBM SPSS AMOS 26® to validate the factor structure of the reward presence scale. The CFA assessed the measurement model comprising three latent constructs: extrinsic reward, psychological reward, and amotivation. The following tables 4.17 and 4.18 show the result of the CFA value and model fit indices.

Table 4.17: The CFA value of the reward presence scale

Indexes	Extrinsic Reward	Psychological Reward	Amotivation	Combined model with 3 factors
χ^2	39.565	70.845	7.759	293.530
df	17	24	2	167
p	.001	.000	.021	.000
GFI	0.975	0.963	0.997	0.928
NFI	0.981	0.969	0.994	0.938
IFI	0.989	0.979	0.997	0.972
TLI	0.982	0.968	0.978	0.968
CFI	0.989	0.979	0.997	0.972
RMSEA	0.061	0.074	0.097	0.046
ECVI	0.215	0.313	0.077	1.054

Each construct was first individually run through CFA, which demonstrated an acceptable to excellent model fit. For Extrinsic Reward, the model fit indices were $\chi^2(17) = 39.565$, $p = .001$, GFI = 0.975, NFI = 0.981, IFI = 0.989, TLI = 0.982, CFI = 0.989, RMSEA = 0.061, and ECVI = 0.215. Psychological Reward also showed good fit, $\chi^2(24) = 70.845$, $p < .001$, GFI = 0.963, NFI = 0.969, IFI = 0.979, TLI = 0.968, CFI = 0.979, RMSEA = 0.074, and ECVI = 0.313. Amotivation demonstrated a satisfactory fit with $\chi^2(2) = 7.759$, $p = .021$, GFI = 0.997, NFI = 0.994, IFI = 0.997, TLI = 0.978, CFI = 0.997, RMSEA = 0.097, and ECVI = 0.077.

Later, a combined CFA was run to test the overall factors model fit indices. The combined three-factor model of the reward presence scale indicated excellent overall fit, $\chi^2(167) = 293.530$, $p < .001$, GFI = 0.928, NFI = 0.938, IFI = 0.972, TLI = 0.968, CFI = 0.972, RMSEA = 0.046, and ECVI = 1.054. The GFI, CFI, and IFI values above 0.90 are considered acceptable, and RMSEA values below 0.05 indicate a very good fit, while values between 0.05 and 0.08 suggest a reasonable fit (Byrne, 2013; Kline, 2018) . Based

on these criteria, the final model demonstrated excellent fit across most indices, with RMSEA indicating very good fit and GFI slightly lower but still acceptable. The measurement model of the path diagram is described in Fig. 4.7.

All factor loadings were significant ($t > 1.96$), confirming that items loaded strongly on their respective latent constructs. These results support the construct validity of the reward presence scale and confirm its suitability for measuring extrinsic reward, psychological reward, and amotivation in the study sample.

Reliability and Validity of Reward Presence Scale

To further evaluate the measurement properties of the reward presence scale, composite reliability (CR) and average variance extracted (AVE) were calculated for each construct (see Table 4.18). A CR value above 0.70 indicates adequate internal consistency, while an AVE value above 0.50 reflects satisfactory convergent validity (Fornell et al., 1981).

The results show that all three constructs met these recommended thresholds. Extrinsic reward demonstrated a CR of 0.935 and an AVE of 0.648, indicating strong internal consistency and convergent validity. Similarly, psychological reward obtained a CR of 0.932 and an AVE of 0.598, also satisfying the recommended cutoffs. The amotivation construct achieved a CR of 0.830 and an AVE of 0.640, which further confirms its reliability and validity.

Overall, these findings provide evidence of robust reliability and convergent validity for the reward presence scale. All factor loadings were significant and ranged from moderate to high (0.597 to 0.838), suggesting that the items contributed meaningfully to their respective constructs. This supports the appropriateness of the three-factor model for measuring reward presence in the present study.

Table 4.18: Summary of constructs and items with factor loading, AVE, CR

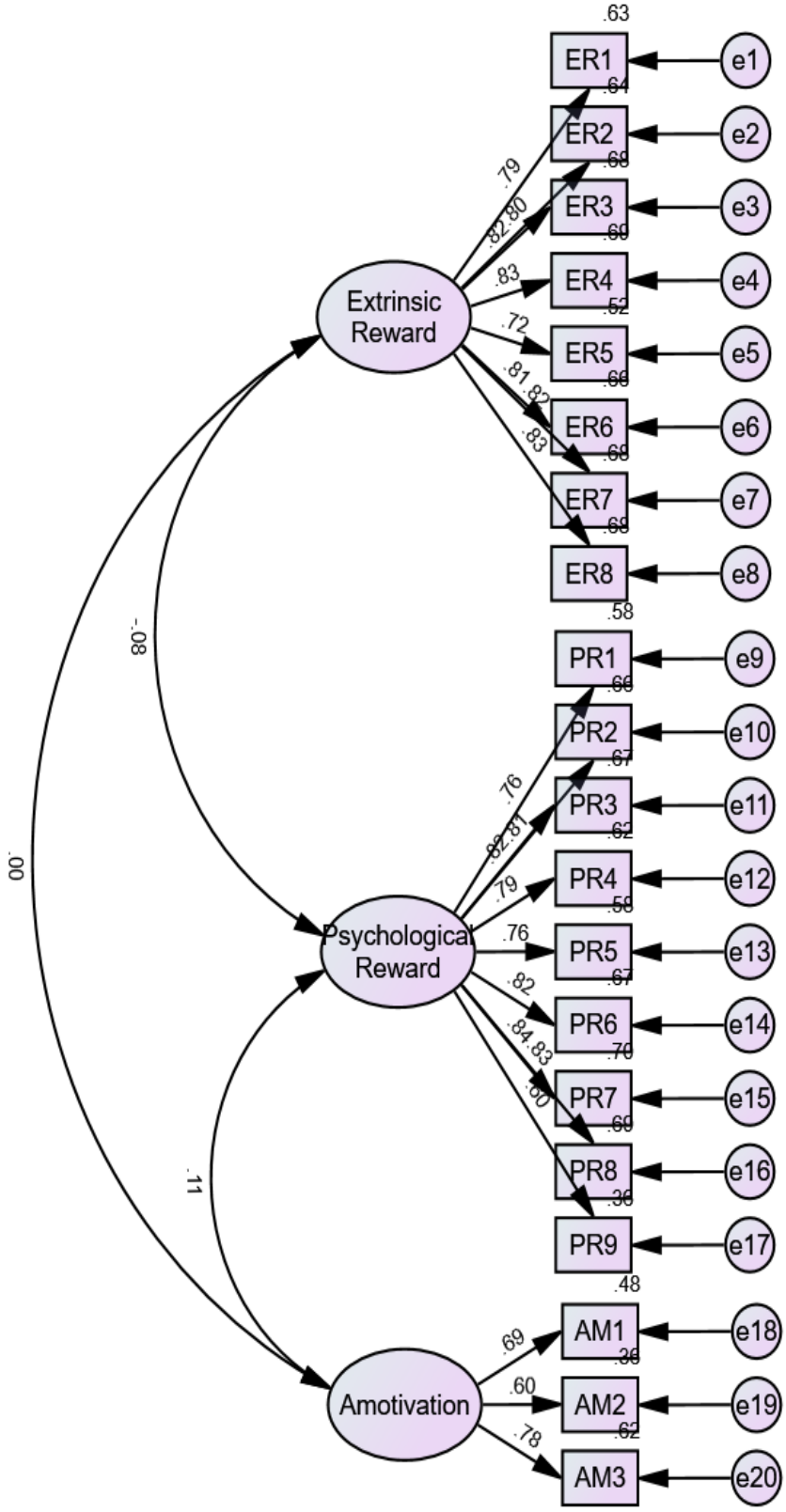
Scale	Codes	Factor Loadings	AVE	CR
Extrinsic Reward			0.648	0.935
I enrol in online courses to earn certificates or badges from the portal.	ER1	0.791		
Seeing my name on the leaderboard motivates me to complete the assignments.	ER2	0.802		
Earning credit points/virtual avatar boosts my motivation and active participation in this course	ER3	0.824		
I am more likely to put in extra effort when there is a gift coupon or cash reward for completing an online course.	ER4	0.828		
The availability of bonus points, gift cards, and stickers influences my decision to take part in online courses.	ER5	0.720		
A cash prize or gifts motivate me to achieve the targeted objective in online courses.	ER6	0.813		
Receiving praise and recognition from peers motivates me to participate in this course.	ER7	0.824		
Encouraging feedback from the course instructor energizes my motivation to overcome various challenges during the course.	ER8	0.828		
Psychological Reward			0.598	0.932
Earning different types of rewards makes me feel empowered to shape my own learning journey.	PR1	0.764		
The rewards allow me to choose how to participate in forums, self-assessments, and assignments, giving me a sense of control.	PR2	0.814		
I feel confident that the gamified rewards let me take ownership of how I engage with the course.	PR3	0.818		

Earning rewards for assignments makes me feel confident in achieving course objectives.	PR4	0.789		
Rewards help me feel capable of overcoming obstacles and achieving learning goals.	PR5	0.763		
Receiving rewards gives me a sense of accomplishment when I perform well.	PR6	0.820		
Sharing rewards (badges, leaderboard ranks) helps me feel connected to my peers.	PR7	0.838		
Recognition through rewards makes me feel supported and motivated.	PR8	0.829		
Receiving positive recognition or rewards for my contributions in forums makes me feel valued and respected.	PR9	0.597		
Amotivation			0.640	0.830
I don't see the rewards in this course that make the learning worthwhile.	AM1	0.691		
Even with rewards, I often feel there is no point in putting effort into this course.	AM2	0.600		
The rewards do not really motivate me because I don't find value in the course itself.	AM3	0.785		

Table 4.19: Discriminant validity of constructs (Fornell-Larcker criterion)

Construct	Extrinsic Reward	Psychological Reward	Amotivation
Extrinsic Reward	**0.805**	–0.075	0.000
Psychological Reward	–0.075	**0.773**	0.110
Amotivation	0.000	0.110	**0.800**

Figure 4.7: Path diagram of combined reward presence scale



4.4.5 Validating the Measurement Model of CoI Presences

For Objective 3, concerning the CoI instrument, the investigator did not perform an EFA, as the CoI scale is a well-established instrument with consistently high factor loadings reported in prior research. Given that the current study primarily involved online learners in higher education, EFA was conducted only for the newly developed reward presence scale to validate its factor structure.

Subsequently, a confirmatory factor analysis (CFA) was conducted on the CoI scale to assess the measurement structure in the present sample. The CFA aimed to verify the factor loadings, model fit, and reliability of the teaching presence, social presence, and cognitive presence constructs, ensuring that the instrument remained valid and reliable for the target population. To ensure clarity, the path diagram is divided into four separate figures (Figures 4.7-4.10), representing each CoI construct: teaching presence, social presence, cognitive presence, and the overall combined model. Each diagram shows the standardised factor loadings of items on their respective latent constructs, allowing for a clear understanding of the model structure.

Table 4.20: The CFA value of CoI presence

Indexes	Teaching Presence	Social Presence	Cognitive Presence	Combined model with 3 factors
χ^2	86.996	36.896	67.469	741.282
df	62	24	48	524
p	.020	.045	.033	.000
GFI	.965	.978	.970	.897
NFI	.953	.968	.969	.870
IFI	.986	.989	.991	.958
TLI	.982	.983	.987	.955
CFI	.986	.989	.991	.958
RMSEA	0.33	.039	.034	0.34
ECVI	.403	.219	.354	2.454

Each construct within the CoI framework was first individually examined through CFA, which demonstrated an acceptable to excellent model fit. For teaching presence, the model fit indices were $\chi^2(62) = 86.996$, $p = .020$, GFI = 0.965, NFI = 0.953, IFI = 0.986, TLI = 0.982, CFI = 0.986, RMSEA = 0.033, and ECVI = 0.403, indicating excellent fit across all indices. Social presence also exhibited a good fit, $\chi^2(24) = 36.896$,

p = .045, GFI = 0.978, NFI = 0.968, IFI = 0.989, TLI = 0.983, CFI = 0.989, RMSEA = 0.039, and ECVI = 0.219. Cognitive presence demonstrated a similarly strong fit, $\chi^2(48) = 67.469$, p = .033, GFI = 0.970, NFI = 0.969, IFI = 0.991, TLI = 0.987, CFI = 0.991, RMSEA = 0.034, and ECVI = 0.354.

Subsequently, a combined CFA was conducted to examine the overall three-factor CoI measurement model. The results indicated a good overall model fit, $\chi^2(524) = 741.282$, $p < .001$, GFI = 0.897, NFI = 0.870, IFI = 0.958, TLI = 0.955, CFI = 0.958, RMSEA = 0.034, and ECVI = 2.454. As per the guidelines, GFI, CFI, and IFI values above 0.90 are considered acceptable, and RMSEA values below 0.05 indicate a very good fit, while values between 0.05 and 0.08 suggest a reasonable fit (Byrne, 2013; Hair et al., 2009; Hu & Bentler, 1999; Kline, 2018) . Based on these criteria, the individual models of teaching, social, and cognitive presence demonstrated excellent fit across all indices, and the overall CoI model also exhibited a good fit, with a slightly lower GFI value that remains within an acceptable range.

All factor loadings were significant ($t > 1.96$), confirming that the items loaded strongly on their respective latent constructs. These results support the construct validity of the CoI measurement model and confirm its suitability for assessing teaching presence, social presence, and cognitive presence among online learners in the current study context.

Table 4.21: Factor loading of the community of inquiry model

Scale	Codes (Items)	Factor Loadings	AVE	CR
Teaching Presence	The instructor clearly communicated important course topics.	.730		
	The instructor clearly communicated important course goals.	.649		
	The instructor provided clear instruction on how to participate in course learning activities.	.599		
	The instructor clearly communicated important due dates/time frames for learning activities.	.603		
	The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	.696		

	The instructor was helpful in guiding the class towards understanding course topics in a way that helped me enhance my knowledge.	.498		
	The instructor helped to keep course participants engaged and participating in productive dialogue.	.669		
	The instructor helped keep the course participants on task in a way that helped me to learn.	.745		
	The instructor encouraged course participants to explore new concepts in this course.	.679		
	Instructor's actions reinforced the development of a sense of community among course participants.	.603		
	The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	.683		
	The instructor provided feedback that helped me understand my strengths and weaknesses related to the course's goals and objectives.	.728		
	The instructor provided feedback in a timely manner.	.538	**0.425**	**.914**
Social Presence	Getting to know other course participants gave me a sense of belonging in the course.	.652		
	I was able to form distinct impressions of some course participants.	.684		
	Online forums are excellent medium for social interaction.	.629		
	I felt comfortable conversing through the online medium.	.690		
	I felt comfortable participating in the course discussions.	.669		
	I felt comfortable interacting with other course participants.	.719		
	I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	.643		
	I felt that my point of view was acknowledged by other course participants.	.648		

	Online discussions help me to develop a sense of collaboration.	.619	**.439**	**.875**
Cognitive Presence	Problems raised in the course materials increased my interest.	.717		
	Course activities stimulated my curiosity.	.760		
	I felt motivated to explore content related questions.	.733		
	I utilized a variety of information sources to explore problems posed in this course.	.671		
	Brainstorming and finding relevant information helped me resolve content-related questions.	.630		
	Online discussions were valuable in helping me appreciate different perspectives.	.719		
	Combining new information helped me answer questions raised in course activities.	.682		
	Learning activities helped me construct explanations/solutions.	.722		
	Reflection on course content and discussions helped me understand fundamental concepts in this class.	.641		
	I can describe ways to test and apply the knowledge created in this course.	.673		
	I have fair understanding of the solutions to course problems that can be applied in practice.	.775		
	I can apply the knowledge created during the course to my work or other non-class related activities.	.711	**.496**	**.930**

Validity and Reliability of the Community of Inquiry Model

To further evaluate the measurement properties of the CoI framework, composite reliability (CR) and average variance extracted (AVE) were calculated for each construct (see Table 4.21). According to Fornell and Larcker (1981), a CR value above 0.70 indicates adequate internal consistency, while an AVE value above 0.50 reflects satisfactory convergent validity (Fornell et al., 1981).

The results show that all three constructs demonstrated strong composite reliability. Teaching presence achieved a CR of 0.914 and an AVE of 0.425. While the AVE value was slightly below the recommended 0.50 threshold, the high CR value suggests acceptable internal consistency, and Fornell and Larcker (1981) note that

convergent validity can still be adequate if AVE is marginally low but CR exceeds 0.60. social presence obtained a CR of 0.875 and an AVE of 0.439, indicating good internal consistency, with AVE marginally below the ideal cutoff (Fornell et al., 1981). Cognitive presence demonstrated a CR of 0.930 and an AVE of 0.496, both approaching or exceeding recommended thresholds, indicating strong reliability and acceptable convergent validity.

Overall, these results provide evidence of robust reliability for all three CoI constructs and acceptable convergent validity, particularly considering the high CR values across the constructs. All factor loadings were significant and ranged from moderate to high, indicating that the observed items contributed meaningfully to their respective latent constructs. This supports the appropriateness of the three-factor CoI model for the present study.

Table 4.22: **Discriminant validity of constructs (Fornell–Larcker Criterion)**

Construct	$\sqrt{AVE}$	Highest correlation with others
Teaching Presence	0.652	0.111, 0.056
Social Presence	0.663	0.111, 0.017
Cognitive Presence	0.704	0.056, –0.017

Discriminant Validity

In addition to assessing convergent validity, discriminant validity was evaluated to ensure that each construct captures unique aspects of the CoI framework. Discriminant validity was examined using the Fornell-Larcker criterion (Fornell et al., 1981). The square roots of the average variance extracted (AVE) for each construct were compared with their inter-construct correlations (see Table 4.21). The diagonal values ($\sqrt{AVE}$) were greater than the corresponding correlations between constructs, indicating that each construct shares more variance with its own indicators than with other constructs. Specifically, the square roots of the AVE values for each construct (teaching presence = √0.425 = 0.652, social presence = √0.439 = 0.663, cognitive presence = √0.496 = 0.704) were compared to the inter-construct correlations (see Table 4.21). These results confirm that discriminant validity was adequately established among the constructs. This demonstrates that teaching presence, social presence, and cognitive presence are empirically distinct constructs and measure separate dimensions of the CoI framework.

Figure 4.8: CFA for CoI teaching presence

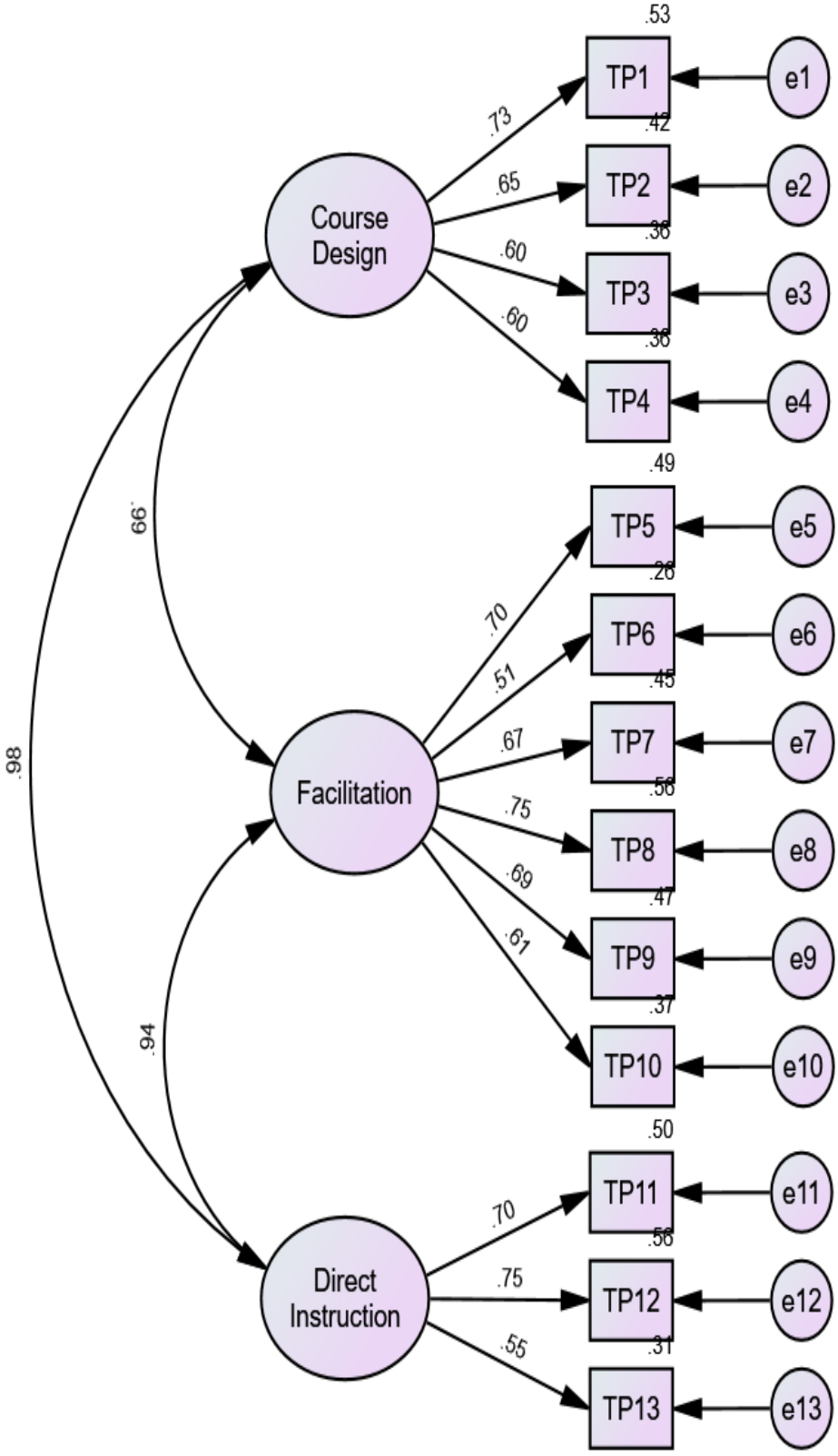


Figure 4.9: CFA diagram for social presence construct

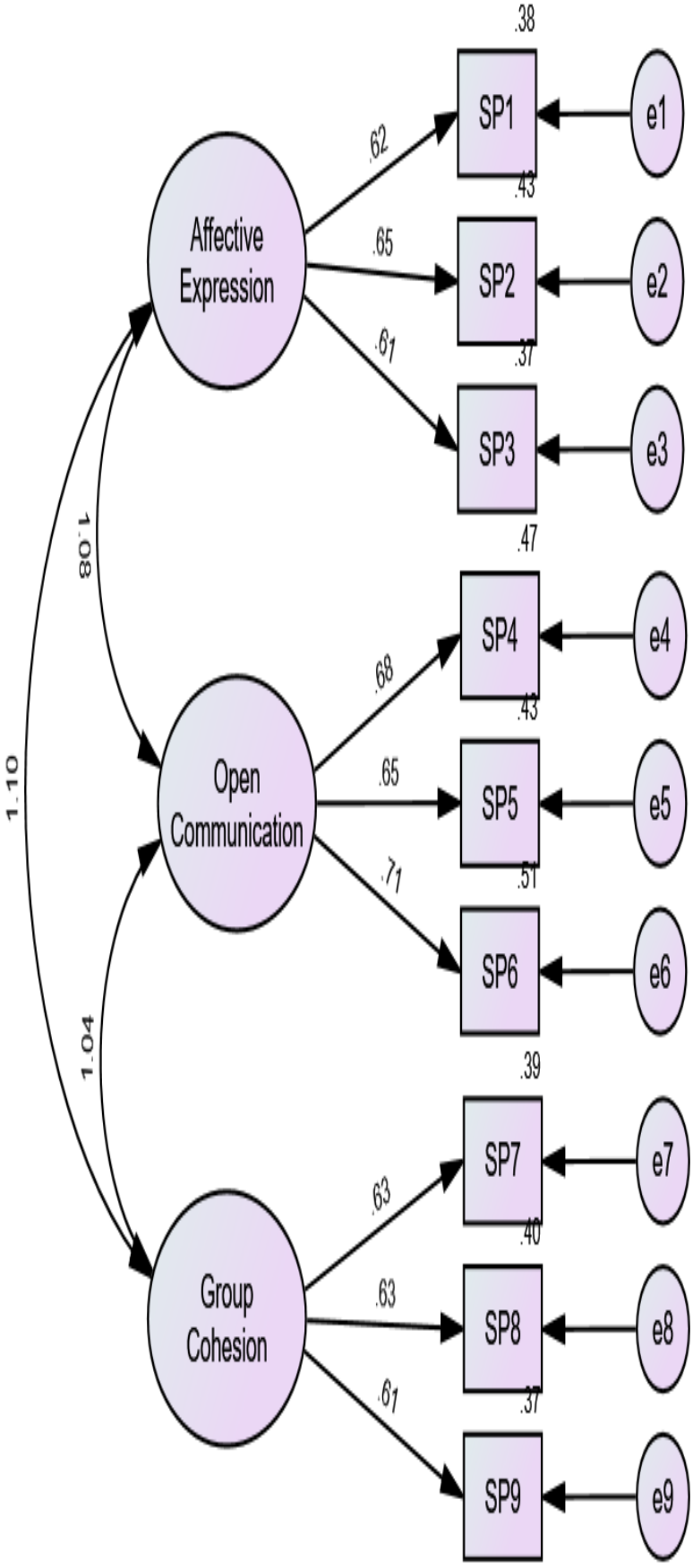


Figure 4.10: CFA for cognitive presence construct

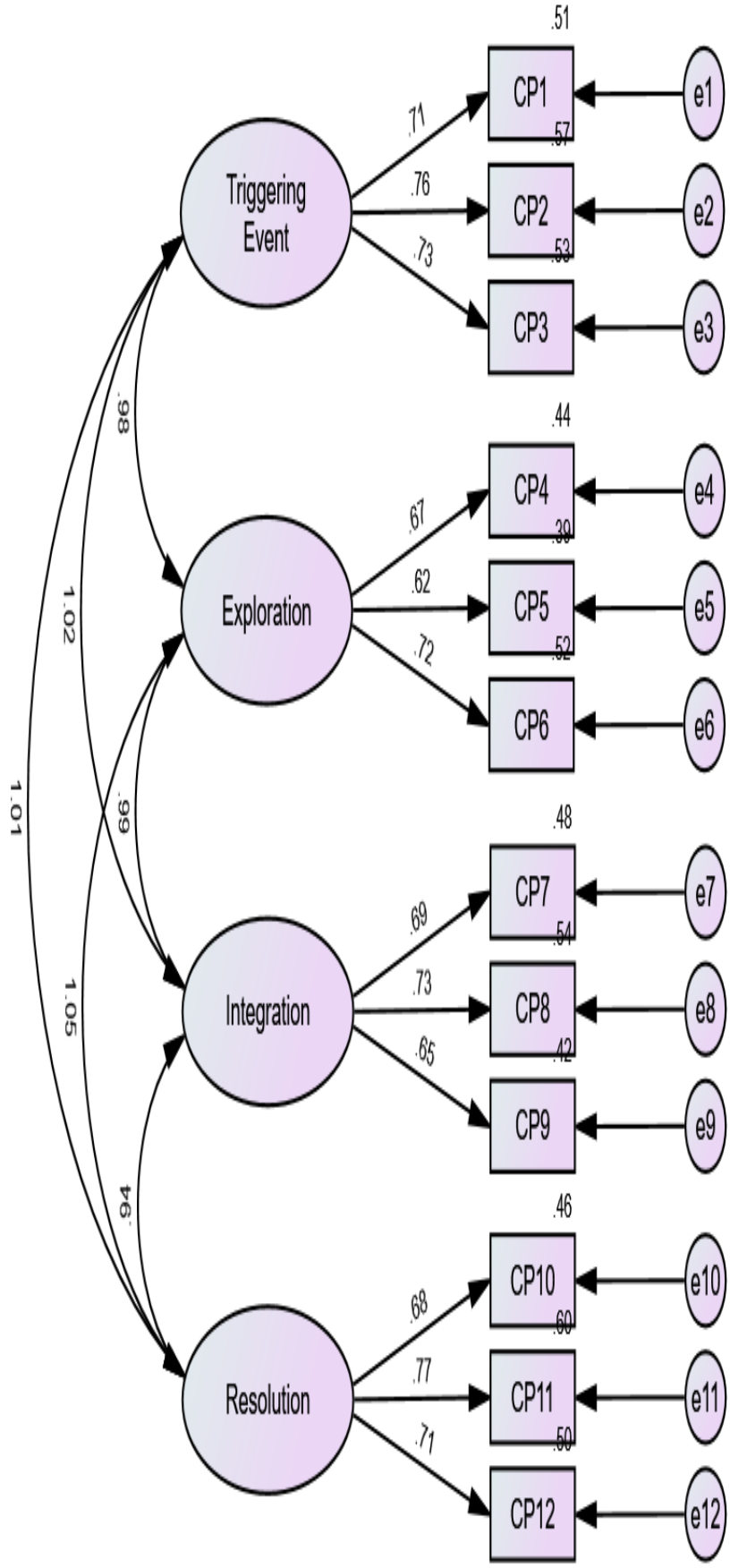
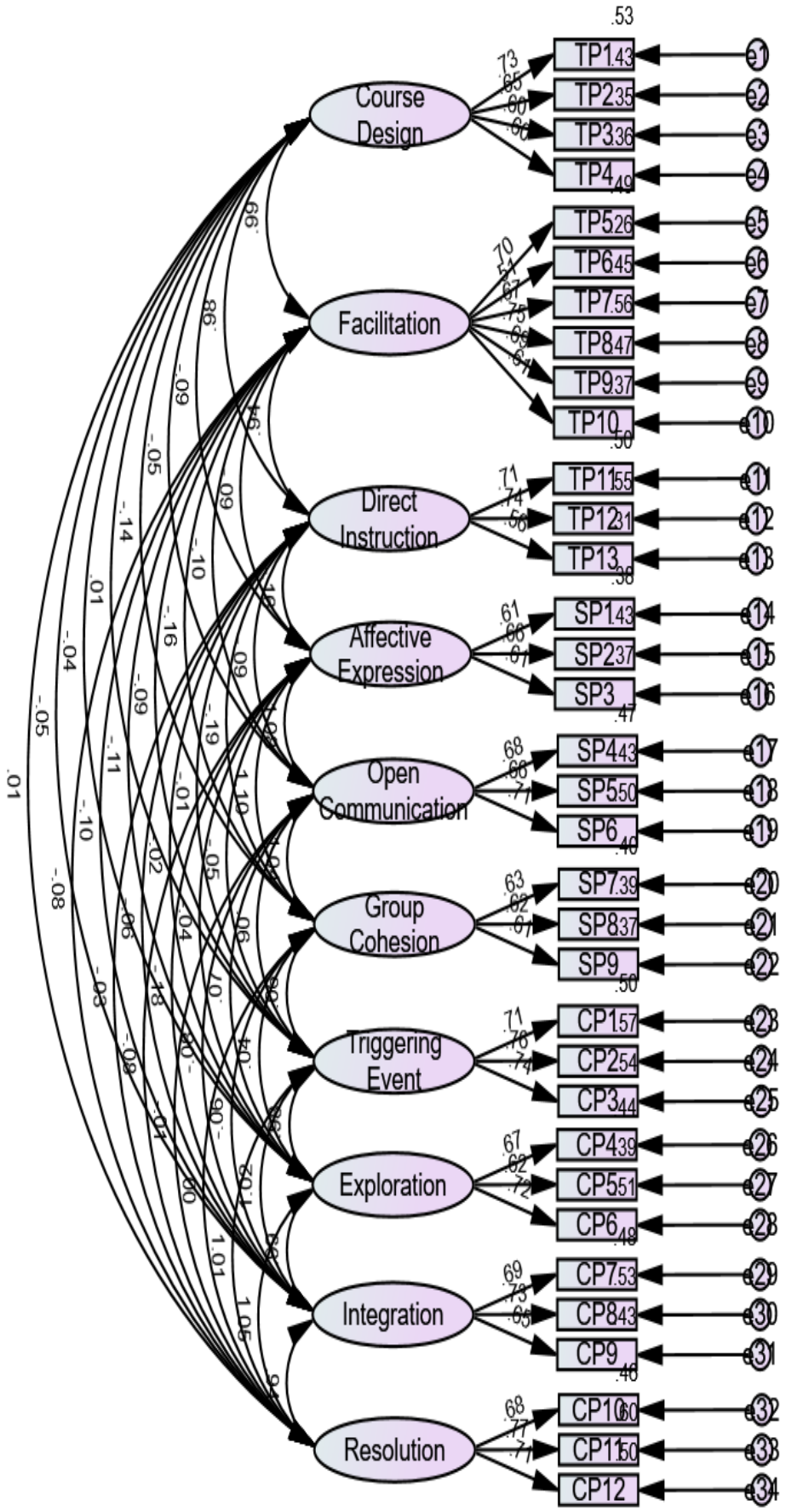


Figure 4.11: CFA of CoI instrument



4.4.6 Relationship between Reward Presence and CoI presences

The third objective of this study was to examine the structural relationships between reward presence and the three presences of the CoI (teaching presence, social presence, and cognitive presence). Reward presence was modelled with three dimensions: extrinsic reward, psychological reward, and amotivation, and specified as exogenous variables, whereas teaching, social and cognitive presence were treated as endogenous variables. This design allowed the study to test how different types of rewards contribute to predicting the CoI presence within the online learning environment (see Figure 4.11).

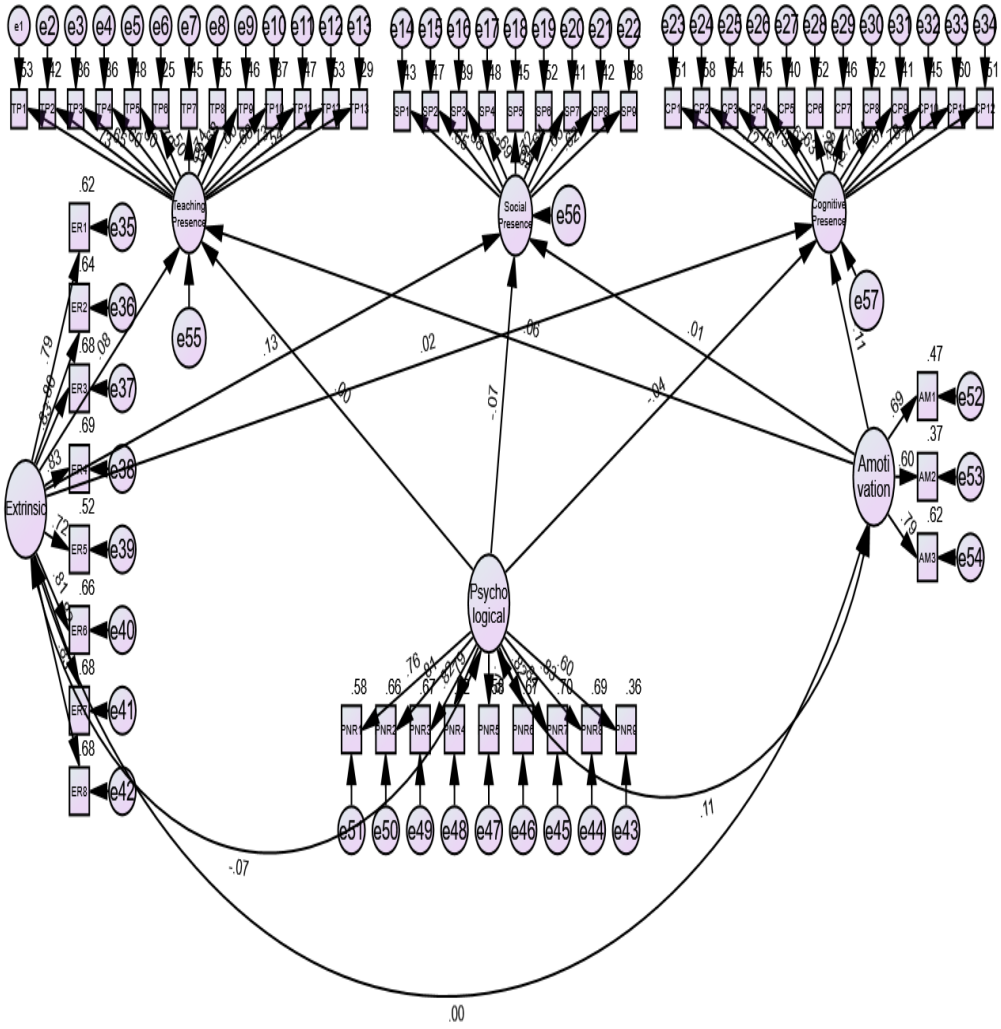
The model fit indices indicated a good fit to the data, $\chi^2(1365) = 1751.873$, $p < .001$, $\chi^2/df = 1.283$, RMSEA = .028 (90% CI = .024 to .032, PCLOSE = 1.000), CFI = .960, TLI = .958, and GFI = .856.

Table 4.23: The standardised regression weights and explained variance (R^2) of CoI presence predicted by reward presence

Dependent Variable	Predictor	β (Estimate)	R^2
Teaching Presence	Extrinsic	.081	.010
	Psychological	.003	
	Amotivation	.057	
Social Presence	Extrinsic	.132	.023
	Psychological	–.065	
	Amotivation	.007	
Cognitive Presence	Extrinsic	.024	.017
	Psychological	–.043	
	Amotivation	–.114	

The findings revealed that none of the standardised regression weights were strong (all $\beta < .15$), and the variance explained in the CoI presences was minimal (1.0% in teaching presence, 2.3% in social presence, and 1.7% in cognitive presence). Therefore, H_{01}, H_{02}, and H_{03} were not supported. Reward presence did not significantly predict the three CoI presences.

Figure 4.12: Relationship of reward presence with CoI presence



4.4.7 Reward Presence as an Additional Presence in the CoI Model

The fourth objective of this study was to evaluate whether reward presence can be conceptualized as an additional presence within the community of inquiry (CoI) framework, alongside teaching presence, social presence, and cognitive presence. To test this, two competing structural models were estimated using AMOS: a baseline three-presence model (teaching, social, cognitive) and an extended four-presence model (teaching, social, cognitive, and reward).

The three-presence model demonstrated an adequate fit to the data (χ^2 = 741.282, df = 524, χ^2/df = 1.415, GFI = .897, CFI = .958, TLI = .955, RMSEA = .034). All indices exceeded or approached recommended thresholds, indicating a satisfactory baseline model (see Table 4.22).

When reward presence was included as a fourth construct, model fit improved further (χ^2 = 1746.366, df = 1362, χ^2/df = 1.282, GFI = .856, CFI = .961, TLI = .959, RMSEA = .028). The relative fit indices (CFI, TLI, IFI) were consistently higher in the four-presence model, while the χ^2/df ratio and RMSEA both indicated stronger parsimony and better overall fit compared to the three-presence model (see Table 4.24).

Table 4.24: Three factor model of CoI and four factor model of reward presence with CoI model fit comparison

Fit Index	Recommended	3 Factor CoI Model	Reward Presence with CoI Model
χ^2/df	< 3.00	741.282 / 524 = 1.415	1746.366 / 1362 = 1.282
GFI	≥ .85	.897	.856
AGFI	≥ .80	.883	.843
CFI	≥ .95	.958	.961
TLI	≥ .95	.955	.959
RMSEA	≤ .06	.034	.028
PCLOSE	> .05	1.000	1.000
AIC	Lower = Better	883.282	1992.366

Simultaneously, the researcher computed the AVE and CR with factor loading (see Table YYY). All factor loadings for extrinsic reward items exceeded .70, indicating strong item reliability. Composite reliability (CR = .940) and average variance extracted (AVE = .647) both surpassed the recommended thresholds (CR > .70, AVE > .50), supporting the convergent validity of the construct. For psychological need reward, all items loaded above .59, with the highest loading at .838. The CR value (.935) was well above the minimum cut-off, and the AVE (.615) exceeded the .50 threshold, confirming adequate reliability and convergent validity. The amotivation dimension showed factor loadings ranging from .604 to .785. While the CR value (.736) indicated acceptable internal consistency, the AVE (.484) was slightly below the recommended cut-off. However, given its theoretical importance, the construct was retained for further analysis.

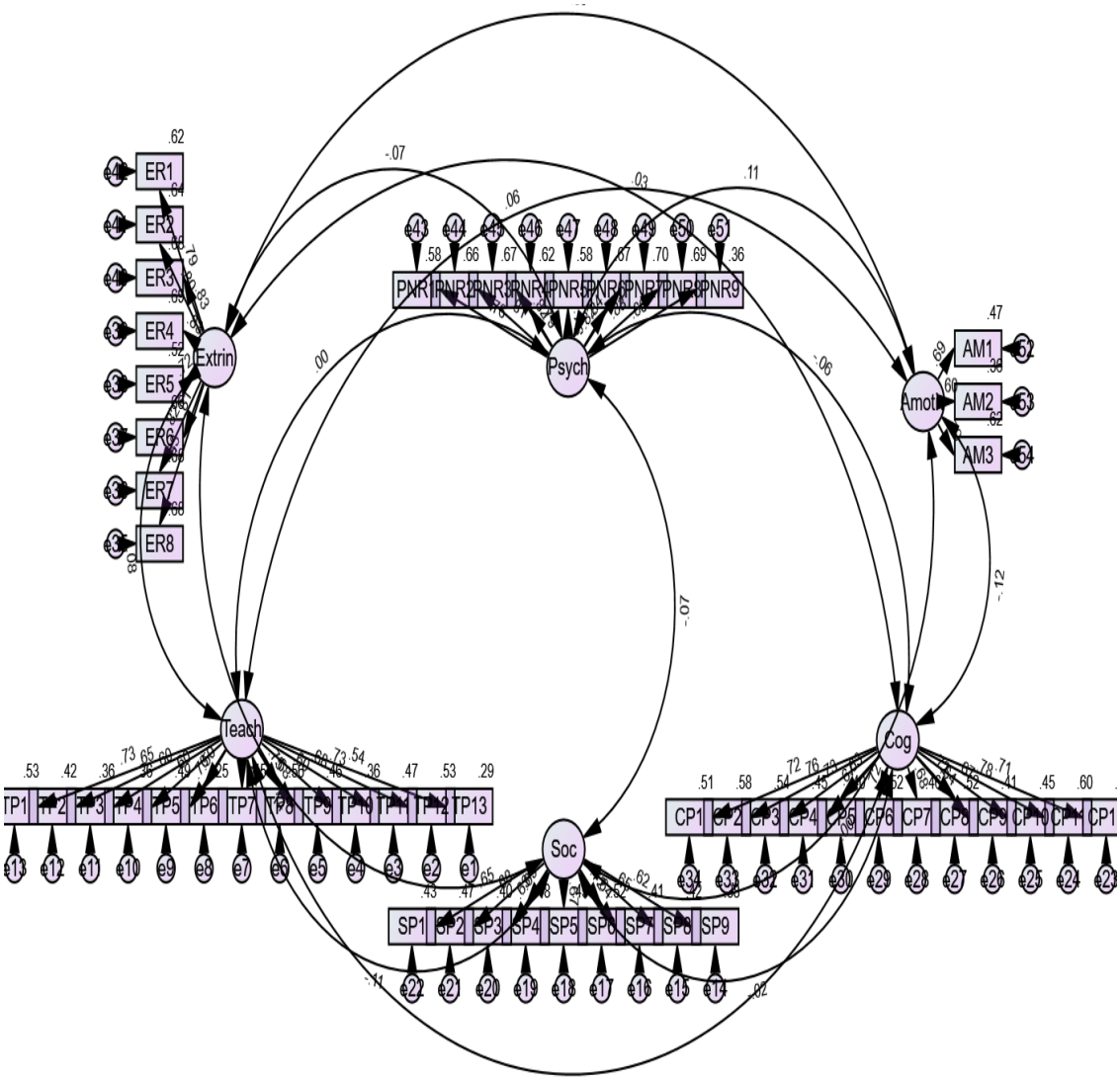
Regarding the CoI constructs, teaching presence items demonstrated loadings from .50 to .74, with CR (.914) exceeding the threshold, though AVE (.425) fell below .50. social presence showed a similar pattern, with loadings between .62 and .72, CR at .875, and AVE at .439. Finally, cognitive presence achieved loadings between .63 and .78, a CR of .930, and an AVE of .496, which was just below the ideal benchmark.

Overall, the measurement model demonstrated satisfactory reliability across all constructs. While some AVE values were slightly below .50 (TP, SP, AM, CP), their strong CR values supported retention. Furthermore, discriminant validity was assessed using the Fornell-Larcker criterion, with the square root of AVE for each construct exceeding its inter-construct correlations, thereby establishing discriminant validity.

Table 4.25: Factor loading with AVE and CR of reward presence and CoI dimensions

Factor	Items	Standardized Loading	AVE	CR
Extrinsic Reward (ER)	ER1 – ER8	.720 – .828	0.647	0.940
Psychological Need Reward (PNR)	PNR – PNR9	.597 – .838	0.615	0.935
Amotivation (AM)	AM1 – AM2	.604 – .785	0.484	0.736
Teaching Presence (TP)	TP1 – TP13	.50 – .74	0.425	0.914
Social Presence (SP)	SP1 – SP9	.62 – .72	0.439	0.875
Cognitive Presence (CP)	CP1 – CP12	.63 – .78	0.496	0.930

Figure 4.13: Path diagram for reward presence as an additional presence in the CoI model



4.5 Hypotheses Testing

The current study measured four hypotheses (H_{01}-H_{04}) using structural equation modelling (SEM) in AMOS 24 version. The first three hypotheses tested the structural relationships between reward presence and the three foundational elements of the CoI model: cognitive presence, social presence, and teaching presence. The fourth hypothesis examined whether reward presence could function as an additional presence within the CoI framework, improving overall model fit.

H_{01}: There exists no significant relationship between reward presence and teaching presence

Structural path analysis revealed weak standardised regression weights between reward presence dimensions and teaching presence (β = .081 for Extrinsic, β = .003 for psychological, β = .057 for amotivation). The explained variance for teaching presence was only 1.0%. These results indicate that reward presence did not significantly predict teaching presence. Therefore, it fails to reject the null hypothesis (H_{01}).

A possible reason for this non-significant relationship could be that the reward presence in the online environment does not directly influence how learners perceive the instructor's teaching presence, which is connected with course formulation, course facilitation, and direct instruction. Rewards may motivate learners individually, but may not alter their perception of the teacher's active role. This suggests that teaching presence is more strongly shaped by pedagogical strategies than by reward mechanisms.

H_{02}: There exists no significant relationship between reward presence and social presence

A comparatively small standardized coefficient was observed for the association between reward presence and social presence (β = .132 for extrinsic, β = -.065 for psychological, β = .007 for amotivation), with $R^2 = 0.023$. Reward presence was not a significant predictor of social presence. Therefore, it fails to reject the null hypothesis (H_{02}).

Rewards in online environments may not inherently enhance interpersonal communication, trust, or a sense of community, which are central components of social presence. In some contexts, extrinsic rewards can even undermine authentic social interaction if learners focus more on individual achievement than collaboration. This suggests that social presence is more likely to develop through interactive, collaborative activities than through reward-based mechanisms.

H_{03}: There exists no significant relationship between reward presence and cognitive presence

The path coefficients were low (β = .024 for extrinsic, β = –.043 for psychological, β = –.114 for amotivation), with an explained variance of 1.7%. This indicates that reward

presence is not a significant predictor of cognitive presence. Therefore, it fails to reject the null hypothesis (H_{03}).

Cognitive engagement and deeper learning processes are influenced more by instructional quality, critical discourse, and reflective activities than by external or psychological rewards. While rewards may initiate engagement, they may not sustain or deepen the cognitive processing required for knowledge construction. This aligns with prior research indicating that rewards primarily affect surface-level participation rather than deeper cognitive involvement.

H_{04}: There exists no statistically significant improvement in model fit with the inclusion of reward presence as an additional presence in the community of inquiry framework.

A comparison between the baseline three-factor CoI model (teaching, social, cognitive) and the extended four-factor model (including reward presence) was conducted. The three-factor model showed an adequate fit, $\chi^2/df = 1.415$, CFI = .958, TLI = .955, RMSEA = .034. When reward presence was added, model fit improved further ($\chi^2/df = 1.282$, CFI = .961, TLI = .959, RMSEA = .028). The improved fit indices support the inclusion of reward presence as an additional presence in the CoI framework. Therefore, the 4th hypothesis rejects the null hypothesis (H_{04}).

The improved fit indices of the four-presence model indicate that reward presence contributes meaningful explanatory power to the overall CoI framework. Although its direct predictive paths to teaching, social, and cognitive presences were weak, its inclusion enhances the structural model, suggesting that reward presence may function as a motivational layer within the CoI model rather than as a direct predictor of the three presences.

CHAPTER - V

SUMMARY AND CONCLUSION

Chapter-V

Summary and Conclusion

5.1 Introduction

This mixed-method study explored the role of rewards in online learning within the community of inquiry (CoI) framework. Drawing on previous research on motivational regulation mechanisms, such as gamification and psychological rewards that align with both extrinsic and intrinsic motivation, the study combined semi-structured interviews with a descriptive survey design to develop a deeper understanding of reward presence and its influence on the CoI framework. At the beginning of this research, it became evident that studies on reward presence within CoI were extremely limited, with no clear conceptual or empirical work directly addressing it. As the research progressed, my understanding of how reward mechanisms could be articulated within the CoI framework expanded significantly. By closely examining the indicators and reward elements that emerged from both interview and survey data, it became clear that rewards serve as a practical mechanism that supports and enhances learning within the CoI.

The community of inquiry (CoI) framework is supported by well-defined constructs and indicators; however, reward presence remains an overlooked yet essential component. While learner presence addresses motivation, it does not fully explain how structured rewards sustain engagement and performance. In particular, the mechanisms through which rewards regulate effort, reinforce participation, and shape learners' self-perceptions remain insufficiently explained within the CoI model.

This study highlights reward presence as a motivational regulator through which both extrinsic and intrinsic rewards enable teaching presence, social presence, and cognitive presence to develop more meaningfully and sustainably in online learning environments. By positioning reward presence as an integrative motivational regulation, the study extends the theoretical robustness of the CoI framework and offers empirical grounding for its inclusion. This chapter presents a comprehensive summary of the major findings, followed by a discussion of their theoretical and practical implications, and concludes with recommendations for future research and practice.

5.2 Findings

Rewards for Engagement in Online Learning Environment

Theme 1: Learner Motivation and Influencing Factors

1. Learners entered online courses with strong intrinsic and goal-oriented motivation, driven by personal interest, professional growth, and career advancement.
2. Despite high baseline motivation, learners experienced demotivation due to delayed instructor feedback, monotonous content, technical issues, limited peer interaction, and poor course design.
3. The absence of instructor responsiveness and feedback led to feelings of disconnection and reduced engagement among learners.
4. Rewards such as certificates, recognition, and course completion acted as motivational triggers that helped learners persist during periods of low interest or fatigue.
5. Extrinsic rewards did not replace intrinsic motivation but supported continued engagement by reinforcing progress, achievement, and persistence in online learning.

Theme 2: Perception and Value of Rewards

6. Learners perceived rewards as emotionally meaningful, providing recognition, validation, and a sense of achievement, particularly in isolated online learning contexts.
7. Certificates were the most valued form of reward due to their tangible academic, professional, and career-related utility.
8. Financial rewards such as scholarships were viewed as powerful motivators, symbolising both material support and recognition of merit.
9. Perceptions of badges were mixed; they were motivating when linked to progress or levels but were often dismissed when lacking practical value.
10. Learners expressed a strong preference for performance-based and effort-linked reward systems, including micro-rewards and redeemable points, over rewards based solely on course completion.

Theme 3: Reward and the Nature of Motivation

11. Learners reported that extrinsic rewards often initiated engagement in online courses, while intrinsic motivation developed as they became more involved in the learning process.
12. Rewards functioned as temporary supports that helped learners persist initially, after which interest in content quality and mastery became primary motivators.
13. Participants preferred rewards to be integrated throughout the learning journey using milestone-based or gamified structures rather than being offered only at course completion.
14. Interactive teaching practices, real-world relevance, and peer interaction were identified as strong motivational factors that enhanced or substituted for external rewards.
15. Learners emphasised the need for a balanced motivational approach, where extrinsic rewards acknowledge effort without overshadowing intrinsic learning satisfaction.

Exploratory Factor Analysis of Reward Presence

16. Exploratory factor analysis conducted on the reward presence scale initially indicated issues of multicollinearity and insufficient sampling adequacy, necessitating item refinement. After removing redundant and cross-loading items, the revised dataset demonstrated excellent factorability, with a KMO value of .935 and a significant bartlett's test of sphericity. The refined EFA revealed a stable three-factor solution using principal component analysis with varimax rotation. All retained items showed strong factor loadings above .79 with no substantial cross-loadings. The final reward presence scale consisted of 20 items, demonstrating a clear and robust underlying factor structure suitable for further validation.
17. Confirmatory factor analysis of the individual latent constructs which are extrinsic reward, psychological reward, and amotivation demonstrated acceptable to excellent model fit across multiple indices. All three constructs showed GFI, CFI, IFI, and TLI values above .95, with RMSEA values within acceptable to reasonable ranges. The results indicate that each construct was well-defined and

adequately represented by its observed indicators. All factor loadings were statistically significant, confirming strong item–construct relationships.

18. The combined three-factor measurement model of the reward presence scale exhibited excellent overall model fit, as indicated by high GFI, CFI, IFI, and TLI values and a low RMSEA. The model demonstrated good construct validity, with all items loading significantly on their respective latent factors. These results confirm the stability and suitability of the three-factor structure of the reward presence scale for measuring reward-related motivational dimensions in online learning contexts.

Validating the Measurement Model of Community of Inquiry (CoI) Presence

19. Confirmatory factor analysis of the individual community of inquiry constructs: teaching presence, social presence, and cognitive presence, demonstrated acceptable to excellent model fit. Teaching presence showed excellent fit ($\chi^2(62) = 86.996$, GFI = 0.965, CFI = 0.986, RMSEA = 0.033), followed by social presence ($\chi^2(24) = 36.896$, GFI = 0.978, CFI = 0.989, RMSEA = 0.039) and cognitive presence ($\chi^2(48) = 67.469$, GFI = 0.970, CFI = 0.991, RMSEA = 0.034). All factor loadings were significant ($t > 1.96$), confirming strong item-construct relationships across the three presences.
20. The combined three-factor CoI measurement model demonstrated a good overall fit to the data ($\chi^2(524) = 741.282$, CFI = 0.958, IFI = 0.958, TLI = 0.955, RMSEA = 0.034), with the GFI value remaining within an acceptable range. The results confirm the stability and construct validity of the teaching, social, and cognitive presence dimensions in the current sample. Overall, the CFA findings support the suitability of the CoI scale for assessing presence in online higher education learning environments.

Examination of the relationship between Reward Presence and each CoI presence (Teaching, Social, and Cognitive)

21. The structural model examining the relationship between reward presence and the community of inquiry presences demonstrated an overall good model fit ($\chi^2(1365) = 1751.873$, $\chi^2/df = 1.283$, RMSEA = .028, CFI = .960, TLI = .958, GFI = .856). Reward presence was specified through three dimensions, extrinsic reward,

psychological reward, and amotivation as exogenous variables predicting teaching presence, social presence, and cognitive presence.

22. The structural path analysis revealed that reward presence did not significantly predict any of the CoI presences, with all standardised regression weights below .15. The explained variance was minimal across the endogenous constructs (teaching presence = 1.0%, social presence = 2.3%, cognitive presence = 1.7%). Consequently, hypotheses H3a–H3i were not supported, indicating no significant direct structural relationship between reward presence and the CoI presences in the model.

Reward Presence as an Additional Presence in the Community of Inquiry Model

23. The baseline three-presence CoI model (teaching, social, and cognitive presence) demonstrated an adequate fit to the data ($\chi^2(524) = 741.282$, $\chi^2/df = 1.415$, GFI = .897, CFI = .958, TLI = .955, RMSEA = .034), indicating a satisfactory representation of the original CoI framework.
24. The extended four-presence model, which incorporated reward presence as an additional construct, showed improved model fit ($\chi^2(1362) = 1746.366$, $\chi^2/df = 1.282$, GFI = .856, CFI = .961, TLI = .959, RMSEA = .028). Comparative fit indices (CFI, TLI, IFI) increased, while RMSEA and χ^2/df decreased, indicating better parsimony and overall fit compared to the three-presence model.
25. The measurement model demonstrated satisfactory reliability and validity across constructs. Extrinsic reward (CR = .940, AVE = .647) and psychological reward (CR = .935, AVE = .615) showed strong convergent validity, while amotivation displayed acceptable reliability (CR = .736) despite a marginally lower AVE (.484). Teaching presence (CR = .914), social presence (CR = .875), and cognitive presence (CR = .930) also demonstrated strong reliability, with AVE values slightly below .50 but supported by Fornell-Larcker evidence of discriminant validity. Collectively, these results support the inclusion of reward presence as a stable and distinct presence within the CoI framework.

5.3 Discussion and Interpretation

The findings of the present study indicate that although learners enter online courses with clear aspirations and enthusiasm, sustained engagement largely depends on the learning environment, instructional support, and reinforcement mechanisms. This

finding aligns with previous research showing that intrinsic interest and self-directed goals are essential for engagement in self-paced learning environments (E. L. Deci & Ryan, 2000; Shea et al., 2012; Hartnett, 2021).

The findings from the theme 1 (learner motivation and influencing factors) highlights that learners' high intrinsic and goal-oriented motivation, aligning with Deci and Ryan's SDT and emphasising autonomy, competence, and relatedness in fostering engagement (Ryan & Deci, 2020). Passion for courses, self-growth, and professional aspirations reflect both autonomous and identified regulation, supporting prior research that online learners show strong self-directed intentions when learning aligns with personal or professional goals (Kizilcec et al., 2017; Kizilcec & Halawa, 2015; Littlejohn et al., 2016). However, demotivating factors such as delayed instructor feedback, monotonous content, and limited peer interaction can reduce engagement, even among intrinsically motivated learners (Falout Joseph, 2012; Kojima, 2021). In this context, rewards act as important motivational regulators, with certificates, badges, gamification, and instructor or peer feedback enhancing engagement during low-interest periods. Extrinsic rewards, when aligned with learners' goals, complemented intrinsic motivation and reinforced self-efficacy, competence, and persistence motivation (Cerasoli et al., 2014; Dec et al., 1999; Wijsman et al., 2019; Maralani et al., 2016). This emphasises the potential of systematic reward strategies to sustain motivation in online learning.

The findings of perception and value of rewards (theme 2) presents that learners perceive rewards not merely as external reinforcements but as emotionally and symbolically meaningful acknowledgements of effort and achievement. Certificates, badges, leaderboards, and similar rewards fulfil psychological needs for recognition and competence, especially in online settings where physical interaction is limited, aligning with self-determination theory (Ryan & Deci, 2020) and prior studies on motivation in remote learning (Hew et al., 2020; Hartnett, 2016). Certificates were particularly valued for their tangible benefits, serving as verifiable evidence of learning that supports career and academic advancement, consistent with expectancy-value theory (Eccles & Wigfield, 2002). Badges motivated learners when hierarchically linked to progression but lost impact when disconnected from genuine effort, supporting gamification research emphasizing meaningful reward design (Coelho et al., 2025; Hamari et al., 2014). Participants also suggested innovative, performance-based rewards such as micro-scholarships, redeemable points, and internship credits, highlighting a preference for fair,

personalised, and continuous incentives (Landers & Armstrong, 2017). Overall, learners value multi-layered reward systems that combine symbolic, tangible, and developmental incentives, fostering both emotional fulfilment and sustained engagement (Figen Gul et al., 2024; Sailer et al., 2017).

The findings under theme 3 (rewards and the nature of motivation) reveal that learners experience motivation as a dynamic and evolving process, where extrinsic rewards and intrinsic drives interact interchangeably rather than functioning as separate forces. Learners who initially enrolled for certificates or badges often reported developing curiosity, enjoyment, and self-directed interest as they progressed. Participants' appreciation for milestone-based or gamified reward systems, such as progress bars, badges linked to specific tasks, or stage-based achievements, resonates with findings in gamified learning research (Bernecker & Ninaus, 2021; Hamari et al., 2014; Landers, 2014; Sailer et al., 2017). Beyond reward mechanisms, participants emphasised the importance of social and contextual factors in sustaining motivation. Their emphasis on peer interaction, instructor feedback, and real-world relevance aligns strongly with the community of inquiry (CoI*)* framework (Garrison et al., 2000). This highlights the multidimensional nature of motivation, rooted not only in personal desire or external recognition but also in social connection and contextual significance (Collie, 2022; Dell, 2021).In sum, the qualitative findings confirm that rewards can bridge motivational gaps and facilitate to frame the conceptual foundation for developing the reward presence scale in phase II of this study, thereby empirically extending the CoI framework to include a motivational dimension, namely reward presence, within the CoI model.

Development and Validation of Reward Presence Scale

The findings of the present study point out the first round of EFA indicated multicollinearity and redundancy among several items, as reflected in the low initial KMO value and non-positive definite correlation matrix. After the removal of weak and redundant items, the KMO value improved substantially to .935, placing it within the 'marvelous' range according to Kaiser's (1974) classification (Kaiser, 1974). The significant Bartlett's Test of Sphericity confirmed that sufficient correlations existed among the remaining items to justify factor analysis. The application of principal component analysis with varimax rotation, as recommended in standard psychometric

practices (Hair et al., 2009), successfully identified a coherent and interpretable structure with strong factor loadings above .79 and minimal cross-loadings. The internal consistency of the three extracted factors was confirmed through Cronbach's alpha analysis. The coefficients for extrinsic reward (.937), psychological reward (.902), and amotivation (.749) demonstrated excellent to acceptable reliability, meeting the conventional standards (Nunnally, 1994). These findings indicate that each dimension of the reward presence scale reliably measures its intended construct, further strengthening its psychometric credibility.

The findings of the confirmatory factor analysis (CFA) revealed that CFA demonstrated acceptable to excellent fit indices (GFI, CFI, IFI > .90 and RMSEA < .08), confirming the robustness of the individual latent constructs. When combined into a full three-factor model, the fit indices (χ^2 = 293.530, df = 167, CFI = .972, TLI = .968, RMSEA = .046) revealed an excellent overall fit (Hair et al., 2009; Hu & Bentler, 1999; Kline, 2018). These findings confirm that the hypothesised three-factor model accurately represents the observed data and that the reward presence scale captures a coherent, multidimensional construct relevant to online learning.

All standardised factor loadings were significant (t > 1.96), further supporting convergent validity. The computed composite reliability (CR) values for the three constructs: extrinsic reward (0.935), psychological reward (0.932), and amotivation (0.830), all exceeded the recommended threshold of 0.70, demonstrating strong internal consistency. Similarly, the average variance extracted (AVE) values (.648, .598, and .640, respectively) were above the 0.50 benchmark, providing additional evidence of satisfactory convergent validity. Collectively, these indicators establish the reward presence scale as a statistically reliable and conceptually valid instrument for measuring motivational dynamics within the community of inquiry (CoI) context.

Validation of CoI Presences (Teaching, Social, Cognitive)

The findings of the CFA demonstrated that all three constructs of the CoI model: teaching presence, social presence, and cognitive presence, achieved satisfactory model fit indices. The fit statistics for each individual construct exceeded the conventional (Hair et al., 2009; Hu & Bentler, 1999) with CFI, IFI, and TLI values all greater than 0.95, indicating excellent model fit. The RMSEA values for each construct were below 0.05, suggesting a close fit between the model and the observed data. These results align with

prior empirical studies that have confirmed the robustness of the CoI measurement model across diverse online learning contexts (Arbaugh et al., 2008; Shea et al., 2010.). The high factor loadings ($t > 1.96$) across all items further reinforce that the observed indicators strongly represented their respective latent constructs.

When the combined three-factor CFA was examined, the overall model also demonstrated a good fit, with indices (CFI = 0.958, IFI = 0.958, RMSEA = 0.034) within the acceptable and ideal ranges, though the GFI (0.897) was slightly below the preferred 0.90 threshold. This minor deviation is not uncommon in complex models involving multiple latent constructs (Kline, 2018) . In terms of reliability and convergent validity, the results indicated that all constructs of the CoI framework exhibited high composite reliability (CR > 0.87), exceeding the minimum criterion of 0.70 (Fornell et al., 1981). Although the average variance extracted (AVE) values for teaching presence (0.425) and social presence (0.439) were slightly below the 0.50 threshold, the high CR values (> 0.87) suggest that these constructs still possess adequate convergent validity. According to Fornell and Larcker (1981), convergent validity remains acceptable when CR values are high, even if AVE falls marginally below the cutoff. Cognitive presence demonstrated both high reliability and near-ideal convergent validity (CR = 0.930, AVE = 0.496), reinforcing the robustness of this construct in measuring the depth of learners' cognitive engagement (Fornell et al., 1981). The discriminant validity results, examined using the Fornell-Larcker criterion, further validated the distinctiveness of the three CoI constructs. These findings are consistent with previous studies (D. Garrison et al., 2010; Shea et al., 2012), which have reported similar evidence of discriminant validity among the CoI dimensions.

Relationships Between Reward Presence and CoI Presence

The findings of the present study reveals that the model fit indices ($\chi^2/df = 1.283$, CFI = .960, TLI = .958, RMSEA = .028) indicated an excellent overall fit, suggesting that the hypothesized model was theoretically sound and statistically acceptable (Hu & Bentler, 1999; Kline, 2018). Despite the strong model fit, the standardized regression weights between reward presence and each of the CoI presences were weak ($\beta < .15$), and the amount of variance explained in teaching presence (1.0%), social presence (2.3%), and cognitive presence (1.7%) was minimal. These results indicate that reward presence, as operationalized in this study, did not significantly predict the three CoI presences. This

finding aligns with the argument that the CoI presences are primarily grounded in social constructivist learning processes (Garrison et al., 2000), which emphasize collaborative meaning-making, facilitation, and discourse rather than external motivational regulation.

A possible explanation for the non-significant relationships could lie in the conceptual distinction between motivation and presence. Reward-based motivation tends to activate goal-oriented and extrinsically driven behaviors (Deci & Ryan, 2000; Ryan & Deci, 2020), whereas the CoI framework reflects socially and cognitively constructed engagement developed through authentic communication and instructor facilitation (Garrison et al., 2010; Shea & T Bidjerano, 2010). Therefore, the impact of rewards might be more indirect, influencing engagement or persistence rather than the structural components of the CoI presences. In this sense, reward presence may operate as a complementary motivational dimension rather than a direct determinant of the CoI presences.

Another plausible reason for the weak associations may relate to the characteristics of the participants and the learning platforms examined. Hence, the effects of external rewards may be diluted in populations where intrinsic and identified motivations dominate learning behaviours (Hartnett, 2016). Moreover, cultural and contextual factors might influence how learners perceive and internalise rewards in online environments (Hofstede, 2011), which could moderate the relationship between reward mechanisms and the social-constructivist dimensions of learning presence.

Previous CoI extensions, such as learner presence (Shea et al., 2012) emotional presence (Cleveland-Innes & Campbell, 2012) and institutional presence (Zhang & Zhu, 2023), have also focused on conceptual and correlational relationships rather than direct prediction, supporting the position that new presences serve to enhance rather than redefine the CoI structure.

Another possible explanation for the non-significant paths relates to contextual and learner characteristics. In higher education settings, learners are often guided by intrinsic and identified motivations, such as gaining knowledge or improving professional competence (Deci & Ryan, 2000). As a result, the effects of external or reward-based incentives may appear weaker, particularly in cultures where intrinsic learning goals dominate (Hofstede, 2011). Therefore, rewards may influence engagement and satisfaction more than the structural presences themselves.

Extended CoI Framework

The findings points out that the foundational CoI model demonstrated a good fit to the data ($\chi^2/df = 1.415$, CFI = .958, RMSEA = .034), consistent with previous studies validating the three-presence structure (Arbaugh et al., 2008; D. Garrison et al., 2010; Shea & T Bidjerano, 2010) . However, when reward presence was incorporated as a fourth latent construct, the model fit improved further ($\chi^2/df = 1.282$, CFI = .961, TLI = .959, RMSEA = .028). The improvement in the comparative fit indices and the reduction in the χ^2/df ratio demonstrate that the extended model achieved better parsimony and overall fit, supporting the theoretical rationale for integrating reward presence into the CoI framework. The incremental improvements in fit indices indicate meaningful structural enhancement rather than statistical redundancy (Hair et al., 2009; Hu & Bentler, 1999), suggesting that reward presence contributes unique variance not captured by the traditional three presences. The validation of the reward presence constructs further reinforced its psychometric soundness, indicating that the constructs measure motivational influences that shape learners' engagement and perceived value in online learning contexts (Deci & Ryan, 2000; Ryan & Deci, 2000).

By recognising the motivational value of both tangible and psychological rewards, learners may feel encouraged to participate more actively (supporting social presence), remain cognitively invested in meaning-making processes (enhancing cognitive presence), and respond more positively to instructional design and facilitation (reinforcing teaching presence) (Lee & Doh, 2012; Saraswati et al., 2020; Xiao et al., 2024). Thus, the inclusion of reward presence extends the CoI framework by integrating a motivational layer that energises and sustains the engagement processes underlying the original three presences (Fiock, 2020; Stenbom, 2018). In particular, psychological rewards such as recognition, self-efficacy, and accomplishment resonate with intrinsic motivation, while extrinsic rewards may serve as initial triggers for engagement, particularly for learners with lower autonomous motivation (Hartnett, 2016). Thus, reward presence can be viewed as a motivational bridge that connects the affective and behavioural aspects of participation within the CoI framework.

Furthermore, the improvement in model fit after integrating reward presence suggests that learners' motivational experiences play an active role in shaping their sense of teaching, social, and cognitive engagement. This finding aligns with contemporary

perspectives on learner engagement, which posit that motivation, emotion, and social interaction collectively influence persistence and learning depth (Artino & Stephens, 2009; Richardson et al., 2010). Therefore, reward presence may serve as a complementary motivational dimension that supports and reinforces the original CoI dimensions, thereby offering a more holistic understanding of online learning experiences in CoI model.

5.4 Theoretical Contributions

The findings of this study make a significant theoretical contribution by extending the community of inquiry (CoI) framework to incorporate a motivational dimension through the concept of reward presence. As a whole, the CoI model (Garrison et al., 2000) has focused on the interplay among teaching presence, social presence, and cognitive presence, emphasising collaborative constructivism as the foundation of meaningful online learning.

Incorporating reward presence can extend the framework by addressing learners' motivational needs beyond self-regulation, fostering greater participation, persistence, and emotional investment in online learning environments. The integration of reward presence addresses this theoretical gap by adding motivation and reinforcement to the online community of inquiry framework.

The inclusion of reward presence may enhance the CoI model as a more holistic framework that acknowledges the roles of both extrinsic and intrinsic motivators in shaping learners' needs within an online learning environment. Drawing from self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2000), reward presence minimises the gap between teaching- social-cognitive interaction by incorporating motivational regulation. It conceptualises motivation not as a background dimension but as an active, structural component influencing the dynamics among the existing presences.

Moreover, the empirical validation of reward presence as an additional latent construct within the CoI model extends the theoretical discourse in online learning settings and motivation research. The improved fit indices in the four-presence model provide empirical support for extending the community of inquiry framework by incorporating reward presence. This enhancement suggests that the addition of reward presence provides meaningful, practice-based incentives such as badges, points, or

progress indicators that actively regulate motivational mechanisms beyond the traditional contributions of motivational theories in the CoI model. This is supported by the emerging perspectives that emphasise affective and motivational dimensions as critical components of learner presence (Fiock, 2020; Stenbom, 2018), and previous studies on gamification research that reveal how reward-based elements can enhance engagement and persistence in online learning environments (Koivisto & Hamari, 2019; Sailer et al., 2017). Thus, reward presence can be viewed as an evolutionary addition to the CoI model, transforming it from a cognitive-social framework into a motivational-social-cognitive framework that better reflects the CoI framework in an online learning environment.

Overall, from a theoretical perspective, reward presence represents the practical application of motivational theory. While earlier studies have mainly emphasised the importance of motivation in learning, they often overlooked how it can be effectively implemented in practice. This study contributes theoretically by introducing reward presence as a new mechanism that emphasises the need for both extrinsic and intrinsic rewards as an additional presence within the community of inquiry (CoI) model. With this, it strengthens the scope of the CoI framework and also opens new theoretical pathways for future research to explore how motivational design elements such as gamification, feedback, and recognition shape learning presence and academic outcomes in online settings.

5.5 Practical Implications

The findings of the study hold valuable practical implications for educators, instructional designers, and policymakers in the field. The validation of reward presence as an additional presence of the community of inquiry (CoI) framework suggests that the motivational need of the learner is necessary not only as a self-regulating aspect but also as the basic psychological need of a learner in learning.

First, the results highlight the need for intentional reward structures within online pedagogical design. Elements such as digital badges, progress tracking, leaderboards, and performance feedback, when meaningfully related to learning objectives, can function as motivational reinforcements that complement teaching presence. Such mechanisms not only validate learner effort but also promote self-regulation and goal-oriented behaviour (Dichev & Dicheva, 2017; Kapp, 2012). Instructors can strategically use these reward features to manage learning tasks, sustain attention, and stimulate intrinsic interest,

particularly in asynchronous online environments where motivation often declines over time.

Second, social presence can be enhanced through reward-based interactions that encourage collaboration and peer acknowledgement. For instance, incorporating recognition systems for constructive participation in discussions or peer feedback can promote a sense of belonging and community. This aligns with previous evidence suggesting that social rewards such as peer appreciation and instructor recognition, reinforce positive engagement behaviours (Hew et al., 2020). Thus, reward presence can be operationalised not only through tangible outcomes but also through emotional and social validation that fosters interpersonal connectedness in online classrooms.

Third, integrating reward presence designs into instructional practice can enhance cognitive presence by motivating learners to persist in complex or reflective learning tasks. Reward cues such as incremental mastery levels or personalised feedback loops can sustain curiosity and critical thinking, particularly in problem-based or inquiry-driven learning contexts. By reinforcing effort and progress, educators can nurture a sense of competence that deepens understanding and encourages reflective judgment (Deci & Ryan, 2000).

At the institutional level, the inclusion of reward presence provides valuable guidance for designing online learning policies and platforms. Learning management systems (LMS) can embed adaptive reward systems that align with pedagogical goals, enabling a balance between enjoyment and educational settings. This approach can contribute to higher learner retention, improved academic satisfaction, and a more psychologically supportive learning climate.

Finally, professional development programs for educators should emphasise the motivational dimension of instructional design. Training teachers to integrate motivational strategies grounded in reward presence, such as positive reinforcement, gamified assessment, and recognition of progress, can lead to more engaging and emotionally rewarding learning environments. This practical application reinforces the idea that effective online education is not only a matter of pedagogy and technology but also of understanding the psychological mechanisms that sustain learner motivation and commitment.

5.6 Study Strengths, Limitations, and Directions for Future Research

A notable strength of this investigation is reflected in its engagement with an active community of online learners, whose participation provided rich, practice-based insights into identifying and exploring reward presence indicators within the community of inquiry framework through a focused and systematic data collection process. The use of semi-structured interviews with active online learners provided rich, context-specific insights into how rewards influence motivation and engagement in online learning. This qualitative foundation offered strong conceptual grounding for the subsequent quantitative phase using structural equation modelling (SEM), which tested and validated the relationship between reward presence and the three CoI presences. Another significant strength is the development and validation of the reward presence scale, which adds a new motivational dimension to the CoI framework. By identifying indicators that connect extrinsic, intrinsic, and psychological rewards to the teaching, social, and cognitive dimensions of online learning, the study makes both a theoretical and practical contribution to understanding motivation in online education. Moreover, integrating reward-based motivational theory with social-constructivist learning theory represents a novel approach, offering a comprehensive view of how motivation interacts with presence in online learning environments.

Despite these strengths, several limitations must be acknowledged. First, the use of criterion-based participant selection limits statistical generalisability; however, this approach is consistent with prior SEM-based educational research aimed at theory testing and model extension rather than population estimation. Future research should extend this work by examining a wider range of learner populations, including secondary school students or adult professionals, to determine whether the proposed reward presence operates similarly across contexts.

Second, the study employed a mixed method design, which restricts the ability to draw causal inferences about the relationships among the CoI presences and reward presence. Future studies could adopt a longitudinal or experimental design to explore how reward-related elements enhance learning and influence sustained engagement and motivation in online learning environments.

Third, although the newly developed reward presence scale demonstrated acceptable reliability and validity, it should be further refined and tested across multiple samples to ensure its robustness. Qualitative approaches, such as interviews or focus groups, could also be employed to deepen understanding of how learners perceive and experience rewards in online learning settings.

Additionally, while the integration of reward presence improved the overall model fit, its predictive strength was relatively low. This may indicate that the relationship between motivational regulation and the CoI presences is mediated by other factors such as emotional engagement, self-efficacy, or learning strategies. Future research could incorporate these mediating or moderating variables to build a more comprehensive understanding of how rewards influence online learning processes.

Lastly, future studies could explore the design and implementation of reward mechanisms such as digital badges, feedback loops, or gamified incentives within CoI-based environments. Such investigations would contribute not only to the theoretical refinement of reward presence but also to its practical application in enhancing learner motivation, persistence, and overall learning experience.

5.7 Conclusion

Building upon the established CoI structure, the study explores the incorporation of reward presence as a complementary dimension interacting with teaching, social, and cognitive presences. Using a mixed-methods design, the study developed, validated, and tested the reward presence scale, examining its relationship with the CoI presences to determine whether it could function as an additional presence within the model.

The major findings can be summarised as follows:

1. **Development and Validation of the Reward Presence Scale:** Through exploratory and confirmatory factor analyses, the reward presence scale was validated with three dimensions: extrinsic reward, psychological reward, and amotivation. The scale demonstrated good construct validity, reliability, and internal consistency, confirming its suitability for assessing reward-related motivation in online learning environments.
2. **Validation of the Community of Inquiry (CoI) Measurement Model:** The CFA results for teaching, social, and cognitive presence indicated good to

excellent model fit, with all factor loadings significant and reliability coefficients exceeding recommended thresholds. This confirmed the applicability of the CoI instrument in the context of Indian higher education learners.

3. **Relationship Between Reward Presence and CoI Presences:** Structural equation modelling revealed that reward presence did not significantly predict teaching, social, or cognitive presence individually. However, minor positive associations were observed, suggesting that reward mechanisms may indirectly influence learner engagement through motivational regulation.
4. **Reward Presence as an Additional Presence:** When reward presence was integrated into the CoI framework as a fourth construct, the overall model fit improved significantly. The enhanced fit indices (e.g., CFI = .961, TLI = .959, RMSEA = .028) demonstrated that reward presence contributed additional explanatory power to the framework, supporting the conceptual argument for its inclusion as a motivational presence.

Overall, the findings indicate that reward presence, though not a strong direct predictor of existing presences, enriches the CoI model conceptually by addressing the motivational dimension of learning engagement, an aspect not explicitly captured in the original framework.

The study set out to extend the community of inquiry (CoI) framework by introducing reward presence as a potential additional presence in online learning environments. While the CoI model has long served as the most cited framework for understanding cognitive, social, and instructional dimensions of online education, it has not adequately incorporated the motivational aspects that sustain learners' motivation. By conceptualising reward presence comprising extrinsic, psychological, and amotivational components, this research contributes to bridging that theoretical gap.

The results reveal that reward presence is a psychometrically sound construct and that its inclusion improves the overall explanatory capacity of the CoI framework. Although reward presence did not exhibit strong direct effects on teaching, social, or cognitive presence, its integration enhanced model fit and theoretical coherence, suggesting that motivation operates as a background mechanism influencing learners' interaction and participation. This implies that reward-base designs integrate well with

the existing presences by reinforcing self-regulation, emotional involvement, and persistence in online learning.

Theoretically, this study expands the CoI framework to include a motivational-mediation dimension, demonstrating that learning in the CoI model is shaped not only by teaching and social presences but also by the regulation of intrinsic and extrinsic motivation through rewards. Practically, the findings offer valuable implications for online educators, instructional designers, and EdTech developers to incorporate thoughtful reward systems that promote sustained engagement and learner satisfaction.

This final chapter presents a summary of the study and highlights the need to continue research on reward presence within the community of inquiry framework. It highlights the growing importance of addressing motivational needs in learning, particularly in light of technological advancements in online education. The chapter also outlines future directions for developing practical pedagogical tools and discusses the key strengths and limitations of this study.

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APPENDICES

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that Miss Runu Mani Das (Reg. No. 20SEMD04), a Ph.D. scholar in the Department of Education and Education Technology, School of Social Science, University of Hyderabad, is working under the supervision of Prof. Madhusudan J.V.

As part of the partial fulfilment of the requirements for the award of the Doctor of Philosophy (Ph.D.) degree, she is undertaking a research study entitled "Reward Presence: Extending the Community of Inquiry Framework in Online Learning." The purpose of this letter is to kindly seek your permission to allow Miss Runu Mani Das to collect data from your esteemed University. The information gathered will be used strictly for academic purposes, and all ethical considerations will be duly adhered to during the process.

Your kind support in facilitating this research study will be highly appreciated and duly acknowledged.

Sincerely,

Prof. Madhusudan J.V.
Professor & Head
Department of Education and Education Technology
University of Hyderabad

TechTrends
https://doi.org/10.1007/s11528-024-00943-4

ORIGINAL PAPER

Analysing the Community of Inquiry Model in the Context of Online Learning: A Bibliometric Study

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Abstract
This paper presents a bibliometric analysis of the community of inquiry model in online learning. The study focuses on identifying the most trending topics, most impact authors, most relevant sources, most relevant countries and most cited articles in the community of inquiry online learning model. Another aim is to understand the literature's factorial analysis, co-occurrence mapping and productivity mapping and the importance of the community of inquiry model in online teaching and learning. A total of 405 studies published between 2015 and 2022 extracted from the Web of Science Core Collection for the study. The results show the extent of growth of research studies in the community of inquiry model. The analysis revealed trends of productive authors and journals, and also identified the top country in terms of publishing articles. It includes a deeper understanding of the intellectual structure and conceptual evolution of the CoI model. Future research should explore advanced bibliometric mapping for CoI dynamics and the factors influencing learner engagement within the community of inquiry model, the role of teaching, cognitive and social presences, and strategies to strengthen the three presences in online learning. The study will help educators and researchers to identify the trends in relation to the community of inquiry framework.

Keywords Community of inquiry · Online learning · Bibliometric analysis

Introduction

The community of inquiry is a theoretical model developed to construct online learning activities for a collaborative and constructive learning experience and a constructive evaluation of the learners' learning process. It is a group of people cooperatively engaging in critical discussion and reflection to develop personal meaning and affirm understanding in reciprocation (Garrison et al., 2010). The model provides quality and dynamic online educational experiences (Arbaugh et al., 2008; Ke, 2010). The model's premise is that higher-order learning is best assisted in a community of learners engaged in critical reflection and discourse (Garrison et al., 2010).

"This model posits that learning occurs in a community due to three elements: social presence, cognitive presence, and teaching presence" (Garrison et al., 2000). Social presence focuses on the important aspects that shape the social climate of the learning community, including student interactivity, group cohesion, and affectivity (Anderson et al., 2001). Cognitive presence, the central component of the model, describes phases of inquiry-based learning, including problem conceptualization, knowledge exploration, synthesis, and eventual solution (Garrison et al., 2000). Teaching presence describes various instructional activities before and during the course, which include course organization and design, direct instruction, and facilitation (Anderson et al., 2001).

Previous studies on the bibliometric analysis of the community of inquiry have focused on the research trends of the authors, sources, organizations, and countries (Yu & Li, 2022). However, this bibliometric analysis primarily explored the conceptual, intellectual, social, and factorial analysis of the community of inquiry framework for present and future researchers to understand the latent dimensions within a dataset, enabling researchers to gain insights into the underlying structure and relationships among variables, helping researchers to identify key works, research themes, interdisciplinary connections, emerging trends and

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Review Article

Collaborative Learning and Learner Engagement within the Community of Inquiry Model: A Systematic Review

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Abstract – The Community of Inquiry (CoI) approach is one of the most recent methods aimed at enhancing learner engagement in online learning environments. This model centers on three key elements: teaching presence, social presence, and cognitive presence. Learner engagement and collaborative learning constitute two fundamental aspects of online education, with a strong focus on mental and social engagement, group activities, and project work. Collaboration among learners and instructors plays a pivotal role in improving the overall online educational experience. This study sought to assess the effectiveness of the Community of Inquiry model in promoting collaborative learning and enhancing learner engagement in online settings. The study employed a systematic review methodology, analyzing eight studies conducted between 1990 and 2021. The findings of the study indicate that the Community of Inquiry model significantly contributes to learners' engagement and fosters collaborative learning among peers, ultimately enhancing learner performance and positively impacting cognitive, emotional, and behavioral engagement.

Keywords: Collaborative Learning, Learner Engagement, Community of Inquiry, Online Learning.

Introduction

The Community of Inquiry (CoI) framework, developed by Garrison, Anderson, and Archer in 1999 is widely used pedagogical model outlines with three critical dimensions for shaping online learning experiences: Cognitive Presence (engaging in critical thinking), Social Presence (building a sense of community), and Teaching Presence (instructor's role in guiding learning) (Kovanović et al., 2018). "The CoI model emphasises on meaningful learning and effective evaluation in a setting of online education" (Garrison et al., 2000). The community of inquiry model is designed to experience collaborative-constructive learning experiences (Garrison et al., 2010). The terms 'community' and 'inquiry' is assumed as the interactive and engaging rather than mere conveniet online learning (Shea et al., 2022). The model has three main components that describe the online epistemic process: cognitive, teaching and social presence. Cognitive presence is defined as the 'the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication' (Garrison et al., 2001). Teaching presence defined as the design, facilitation, and direction of cognitive and social processes for fulfilling the meaningful educational outcomes (Anderson et al., 2001). Teaching presence is the direction or the instruction given by the teacher through instructional management, direct instruction for the development of social and cognitive presence (Lowenthal & Dunlap, 2010). Social presence is defined as the idea of expressing and interacting collaboratively with the degree of comfort and confidence in the online learning. It projects learners socially and emotionally with the medium of communication. The phases of social presence include affective expression, open communication and group cohesion. It develops a sense of belongingness (Alman et al., 2012; Sung & Mayer, 2012) among the learners to discourse cognitive presence in the online learning (Alman et al., 2012; Sung & Mayer, 2012).

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Augmented Reality as a Performance Enhancement Technology in Primary Education: A Systematic Review

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Abstract

Augmented reality combines virtual objects into the real environment to enhance the performance of the real environment. In the educational field, augmented reality has been used to improve learner performance and make education advantageous. Especially in primary education, applications related to augmented reality have been developed to make education interesting and meaningful. However, only a few studies have analyzed and discussed the effectiveness of augmented reality on students' performance in primary education. In this context, the author seeks to find out the factors related to AR that enhances students' performance in primary school. Based on the previous studies, this study provides a systematic review of current knowledge and information. Mainly 14 research papers referred to the topic have been chosen to analyze the data which were published from 2018 to 2021. The result shows augmented reality applications have positive effects on learners' performance. The observation and results signify that augmented reality applications enhance the learners' motivation, interest, and academic performance of the learner.

Contents

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1. Introduction

In an educational setting, primary education is the first stage of formal education. It is the stage of learning basic concepts and acquiring basic information of formal education. Primary education mostly focused on playful learning for the development of the cognitive abilities of the learner in a joyful way. Therefore, teaching methods in primary education need to be modified and explore different aspects to enhance the learner's performance in primary education.

Integration of technology in the teaching-learning process is exploring new ways of enhancing students' performance. The use of ICT tools, virtual reality, mixed reality, digital games, etc. is the recent technological integration in the primary education system. Within these, augmented reality is also one of the enhanced technologies that have been developing an increasing interest in today's primary educational field.

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APPENDIX A

SEMI-STRUCTURED INTERVIEW

Thank you for agreeing to participate in this study. The purpose of this research is to explore how rewards influence engagement, participation, and retention in online learning. Your responses will be kept confidential and used only for academic research to help develop theory in this area. Your participation is voluntary, and you may withdraw at any time. With your permission, I will now turn on the audio recorder to accurately capture your responses. The interview will take about 20–25 minutes. Shall we begin?

Identification Information

Time of Interview:
Date:
Place:
Interviewer:
Interviewee Name:
Position of interview:

Questions:

1. How would you define rewards in the context of online learning?
2. Have you come across any forms of rewards in your online learning experience? If yes, could you explain?
3. How do rewards influence your motivation and engagement when it comes to online learning?
4. Can you share any personal experiences where receiving rewards or recognition has made a noticeable impact on your learning journey?
5. How do rewards influence the learning experience in online courses? Do they enhance intrinsic motivation?
6. Is there specific type of rewards that you find more motivating or meaningful in an online learning environment? why?
7. Do you believe that rewards should be an integral part of online learning? Why or why not?
8. Are there any alternate approaches that can effectively foster motivation and engagement in online learning?

9. How can rewards be used effectively in online learning to strike a balance between extrinsic and intrinsic motivation?

Probing Questions:

Can you elaborate on why that particular reward was motivating?

How did that experience compare to courses where rewards weren't used?

APPENDIX B

COMMUNITY OF INQUIRY SURVEY INSTRUMENT

This instrument consists of statements about teaching presence, social presence and cognitive presence. The scale consists of 34 items. Each statement has a 5-point rating scale ranging from “Strongly Agree” to “Strongly Disagree”. If you have ever used platforms like SWAYAM, Coursera, NPTEL, Udemy or any other online learning platform, please take 10 to 15 minutes to fill out this survey. You are requested to read each item thoroughly and give your responses by making Tick (☐) on the appropriate box that best describes you. Please note that you have not to judge the items in terms of their desirability and undesirability. You have to record your responses with regard to each statement. Your responses will remain confidential.

S.NO	STATEMENT	SA	A	N	DS	SDA
1	The instructor clearly communicated important course topics.					
2	The instructor clearly communicated important course goals.					
3	The instructor provided clear instruction on how to participate in course learning activities.					
4	The instructor clearly communicated important due dates/time frames for learning activities.					
5	The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.					
6	The instructor was helpful in guiding the class towards understanding course topics in a way that helped me enhance my knowledge.					
7	The instructor helped to keep course participants engaged and participating in productive dialogue.					

8	The instructor helped keep the course participants on task in a way that helped me to learn.					
9	The instructor encouraged course participants to explore new concepts in this course.					
10	Instructor's actions reinforced the development of a sense of community among course participants.					
11	The instructor helped to focus discussion on relevant issues in a way that helped me to learn.					
12	The instructor provided feedback that helped me understand my strengths and weaknesses related to the course's goals and objectives.					
13	The instructor provided feedback in a timely manner.					
14	Getting to know other course participants gave me a sense of belonging in the course.					
15	I was able to form distinct impressions of some course participants.					
16	Online forums are excellent medium for social interaction.					
17	I felt comfortable conversing through the online medium.					
18	I felt comfortable interacting with other course participants.					
19	I felt comfortable participating in the course discussions.					

20	I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.					
21	I felt that my point of view was acknowledged by other course participants.					
22	Online discussions help me to develop a sense of collaboration.					
23	Problems raised in the course materials increased my interest.					
24	Course activities stimulated my curiosity.					
25	I felt motivated to explore content related questions.					
26	I utilized a variety of information sources to explore problems posed in this course.					
27	Brainstorming and finding relevant information helped me resolve content related questions					
28	Online discussions were valuable in helping me appreciate different perspectives.					
29	Combining new information helped me answer questions raised in course activities.					
30	Learning activities helped me construct explanations/solutions.					
31	Reflection on course content and discussions helped me understand fundamental concepts in this class.					
32	I can describe ways to test and apply the knowledge created in this course.					

33	I have fair understanding of the solutions to course problems that can be applied in practice.					
34	I can apply the knowledge created during the course to my work or other non-class related activities.					

5-point Likert-type scale 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

COMMUNITY OF INQUIRY SURVEY INSTRUMENT

Item No.	SA	A	N	DS	SDA		Item No.	SA	A	N	DS	SDA
1							18					
2							19					
3							20					
4							21					
5							22					
6							23					
7							24					
8							25					
9							26					
10							27					
11							28					
12							29					
13							30					
14							31					
15							32					
16							33					
17							34					

APPENDIX C

REWARD PRESENCE SCALE

This instrument consists of statements about role of motivation as Reward Presence. The scale consists of 20 items. Each statement has a 5-point rating scale ranging from "Strongly Agree" to "Strongly Disagree". If you have ever used platforms like SWAYAM, Coursera, NPTEL, Udemy or any other online learning platform, please take 10 to 15 minutes to fill out this survey. You are requested to read each item thoroughly and give your responses by making Tick (☐) on the appropriate box that best describes you. Please note that you have not to judge the items in terms of their desirability and undesirability. You have to record your responses with regard to each statement. Your responses will remain confidential.

S.NO	STATEMENT	SA	A	N	DS	SDA
1	I enrol in online courses to earn certificates or badges from the portal.					
2	Seeing my name on the leaderboard motivates me to complete the assignments.					
3	Earning credit points/virtual avatar boosts my motivation and active participation in this course.					
4	I am more likely to put in extra effort when there is a gift coupon or cash reward for completing an online course.					
5	The availability of bonus points, gift cards, and stickers influences my decision to take part in online courses.					
6	A cash prize or gifts motivate me to achieve the targeted objective in online courses.					

7	Receiving praise and recognition from peers motivates me to participate in this course.					
8	Encouraging feedback from the course instructor energizes my motivation to overcome various challenges during the course.					
9	Earning different types of rewards makes me feel empowered to shape my own learning journey.					
10	The rewards allow me to choose how to participate in forums, self-assessments, and assignments, giving me a sense of control.					
11	I feel confident that the gamified rewards let me take ownership of how I engage with the course.					
12	Earning rewards for assignments makes me feel confident in achieving course objectives.					
13	Rewards help me feel capable of overcoming obstacles and achieving learning goals.					
14	Receiving rewards gives me a sense of accomplishment when I perform well.					
15	Sharing rewards (badges, leaderboard ranks) helps me feel connected to my peers.					
16	Recognition through rewards makes me feel supported and motivated.					
17	Receiving positive recognition or rewards for my contributions in forums makes me feel valued and respected.					

18	I don’t see the rewards in this course that make the learning worthwhile.					
19	Even with rewards, I often feel there is no point in putting effort into this course.					
20	The rewards do not really motivate me because I don’t find value in the course itself.					

5point Likert-type scale 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

REWARD PRESENCE SCALE

Item No.	SA	A	N	DS	SDA		Item No.	SA	A	N	DS	SDA
1							11					
2							12					
3							13					
4							14					
5							15					
6							16					
7							17					
8							18					
9							19					
10							20					

APPENDIX D

Reward Presence: Extending the Community of Inquiry Framework in Online Learning

by Runu Mani Das

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