

Faculty of Cognitive Sciences and Human Development

Investigating the Influence of Group Work on Knowledge-building and Application Among Economics Students at Tertiary Level

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Investigating the Influence of Group Work on Knowledge-building and Application Among Economics Students at Tertiary Level

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

Previous studies in economics education have identified gaps between students' engagement in constructing knowledge and their ability to apply it in the real world. Recent work suggests that transforming the conventional economics classroom into an active and student-focused learning environment is highly recommended. Upon closer examination of past studies, it was discovered that they were grounded in Sociocultural and Social Constructivism Theories, focusing on active and social engagement within the learning process. This recognition of student engagement with group members and the development of essential skills for navigating real-world complexities underpin these studies. Hence, group work emerges as a recommended strategy to enhance the student learning experience, aligning with the demands of future professional settings. This study uses a qualitative research design and strict trustworthiness criteria at a selected university to explore how students' epistemological engagement impacts their real-world knowledge application. This data highlights how 86 participants collaborated on a group assessment, revealing insights into their knowledge-building experiences. A teaching and learning model for effective knowledge application in economics is recommended, contributing to the theoretical, epistemological, and practical significance relevant to teaching and learning economics. Future studies can broaden the inquiry by expanding data collection to other higher-level institutions, including other business subjects, and conducting a comparative analysis between experimental and control groups in economics.

Keywords: Group work, economics, knowledge-building, knowledge application

Menyiasat Pengaruh Kerja Kumpulan Terhadap Pembinaan Pengetahuan dan Aplikasi dalam Kalangan Pelajar Ekonomi di Peringkat Pengajian Tinggi

ABSTRAK

Kajian terdahulu dalam pendidikan ekonomi telah mengenal pasti jurang antara penglibatan pelajar dalam membina pengetahuan dengan keupayaan mereka untuk mengaplikasikannya dalam dunia sebenar. Kerja terkini mencadangkan bahawa mengubah bilik darjah ekonomi konvensional kepada persekitaran pembelajaran yang aktif dan berfokuskan pelajar adalah sangat disyorkan. Apabila kajian lepas diteliti, didapati bahawa kebanyakannya berasaskan Teori Konstruktivisme Sosiobudaya dan Sosial, dan kajian-kajian tersebut memberi tumpuan kepada penglibatan aktif dan sosial dalam proses pembelajaran. Pengiktirafan penglibatan pelajar dengan ahli kumpulan dan pembangunan kemahiran dianggap penting untuk mengemudi kerumitan dunia sebenar, dan cetusan idea ini menyokong kajian ini. Oleh itu, tesis ini menyarankan kerja kumpulan sebagai strategi untuk meningkatkan pengalaman pembelajaran pelajar, selaras dengan tuntutan tetapan profesional masa hadapan. Kajian ini meneroka bagaimana penglibatan epistemologi pelajar memberi kesan kepada aplikasi pengetahuan dunia sebenar mereka, menggunakan reka bentuk penyelidikan kualitatif dan kriteria kebolehpercayaan yang ketat di universiti yang dipilih sebagai lokasi kajian ini. Data kajian menunjukkan cara 86 peserta bekerjasama dalam penilaian kumpulan, dan mendedahkan cerapan tentang pengalaman membina pengetahuan bersama-sama. Model pengajaran dan pembelajaran untuk aplikasi pengetahuan yang berkesan dalam konteks pembelajaran ekonomi disyorkan, menyumbang kepada kepentingan teori, perspektif epistemologi dan keperluan praktikal yang berkaitan dengan pengajaran dan pembelajaran ekonomi. Kajian masa depan boleh meluaskan inkuiri dengan menggunakan variasi pengumpulan data ke beberapa institusi peringkat tinggi, termasuk subjek perniagaan lain,

dan menjalankan analisis perbandingan antara kumpulan eksperimen dan kawalan dalam konteks pembelajaran ekonomi di tahap pengajian tinggi.

Kata kunci: *Kerja kumpulan, ekonomi, pembinaan pengetahuan, aplikasi pengetahuan*

TABLE OF CONTENTS

		Page
DECLARATION		i
ACKNOWLEDGEMENT		ii
ABSTRACT		iii
ABSTRAK		iv
TABLE OF CONTENTS		vi
LIST OF TABLES		xii
LIST OF FIGURES		xiv
LIST OF ABBREVIATIONS		xv
CHAPTER 1:	**INTRODUCTION**	1
1.1	Study Background	1
1.2	Learning and Teaching Economics in Higher Education	2
1.3	Problem Statement	5
1.4	Research Aim and Research Objectives	8
1.5	Research Questions	9
1.6	Conceptual Framework	11
1.7	Significance of the Study	14
1.7.1	Epistemological Significance	15
1.7.2	Practical Significance	16

1.7.3 Theoretical Significance 17

1.8 Definition of Terms 18

1.8.1 Discourse 18

1.8.2 Group Work 19

1.8.3 Knowledge-building 19

1.8.4 Knowledge Application 19

1.8.5 Developmental Shifts 19

1.8.6 Intellectual Progress 20

1.9 Chapter Summary 20

CHAPTER 2: LITERATURE REVIEW 21

2.1 Overview 21

2.2 Theoretical Foundation of this Study 21

2.2.1 Sociocultural Theory 23

2.2.2 Social Constructivism Theory 26

2.2.3 Social Cognitive Theory (SCT) 27

2.2.4 Cognitive Load Theory (CLT) 28

2.2.5 Self-Regulated Learning Process 29

2.2.6 Theoretical Framework 32

2.3 Economic Knowledge and Proficiencies 34

2.4 The Practice of Knowledge-building 38

2.5 Learning Outcomes of Group Work 44

2.6 Importance of Collaborative Learning in Group Work 52

2.7 Authenticity and Practicability of Real-World Problems 55

2.8 Knowledge-building Through Discourse 60

2.9 Relationship between Conceptual Change and Knowledge-building 66

2.10 Chapter Summary 69

CHAPTER 3: RESEARCH METHODOLOGY 70

3.1 Overview 70

3.1.1 Research Paradigm 70

3.1.2 Research Method 73

3.1.3 Research Design 74

3.2 Sampling Method 76

3.2.1 Selection of the Site of the Study 76

3.2.2 Pilot Study 78

3.2.3 Selection of Key Informants 79

3.2.4 Number of Participants 81

3.2.5 Phases of Study 83

3.3 Data Collection Methods 84

3.3.1 Observations 84

3.3.2 Interviews 88

3.4 Functions of Memo 95

3.5 Data Triangulation 96

3.6 Trustworthiness of Data 97

3.7 Storage of Data 102

3.8 Data Analysis 102

3.9 Data Saturation 108

3.10 Second-Level Codes and Themes 110

3.11 Delimitations of the Study 112

3.12 Chapter Summary 113

CHAPTER 4: FINDINGS 114

4.1 Overview 114

4.2 Findings 114

4.2.1 Research Question One 114

4.2.2 Research Question Two 123

4.2.3 Research Question Three 131

4.2.4 Research Question Four 139

4.3 Summaries of the Findings 144

4.4 Chapter Summary 151

CHAPTER 5 DISCUSSION AND CONCLUSION 152

5.1 Overview 152

5.2 Discussion 152

5.2.1 Research Question One 153

5.2.1.1 Contextualisation 153

5.2.1.2 Individual and Collective Responsibility Awareness 158

5.2.1.3 Collaborative Learning 160

5.2.2 Research Question Two 162

5.2.2.1 The Emergence of Productive Discourse 163

5.2.2.2 Open Communication 164

5.2.2.3 Receptive to New Ideas and Perspectives 167

5.2.3 Research Question Three 170

5.2.3.1 Improvements in the Ability to Analyse Prior and/or Current Knowledge Gaps 170

5.2.3.2 Enhanced Comprehension of Contemporary Economic Issues 171

5.2.3.3 Continual Refinement of Ideas Regarding Contemporary Economic Issues 173

5.2.3.4 Advancement in Knowledge Regarding Contemporary Economic Issues 175

5.2.4 Research Question Four 176

5.2.4.1 Enhanced Proficiency in Relating Knowledge to Contemporary Economic Issues 176

5.2.4.2 Enhanced Capability to Link Contemporary Economic Issues with Prospects 178

5.2.4.3 Repositioning on Economic, Social and Political Issues 179

5.3 A Proposed Model for Teaching and Learning in Economics 182

5.4 Implications of the Study 184

5.4.1 Theoretical Implications 185

5.4.2 Practical Implications 186

5.4.3 Epistemological Implications 188

5.5 Limitations of the Study 189

5.6 Recommendations for Future Study 190

5.7 Concluding On 192

REFERENCES 194

APPENDICES 224

LIST OF TABLES

Page

Table 1.1: Relationship between Problem Statement, Research Gaps, Aim, Objectives and Questions 10

Table 2.1: Expected Economic Proficiencies 36

Table 3.1: Number of Participants in Three Stages of Data Collection 83

Table 3.2: Interview Protocol Refinement (IPR) Method 91

Table 3.3: Strategies to Ensure Trustworthiness 99

Table 3.4: Intercoder-agreement 101

Table 3.5: Number of Codes Generated from Data Collection Methods 105

Table 3.6: Overlapped First-level Codes Emerged in Observation, Group and Individual Interviews 106

Table 3.7: Generalisation of Themes from Codes 111

Table 4.1: The Matrices of Findings and Sources of Data Triangulation for Research Question One 115

Table 4.2: Selected Quotations Related to Relationship Building Coded in Group Interviews 118

Table 4.3: The Matrices of Findings and Sources of Data Triangulation for Research Question Two 123

Table 4.4: Sum of Groundedness of Codes for Progressive Discourse 125

Table 4.5: The Matrices of Findings and Sources of Data Triangulation for Research Question Three 132

Table 4.6: Excerpt One Illustrates the Analysis of the Continual Refinement of Ideas 135

Table 4.7: Excerpt Two Illustrates the Analysis of the Continual Refinement of Ideas 136

Table 4.8: The Matrices of Findings and Sources of Data Triangulation for Research Question Four 139

Table 4.9: The Summaries of Findings for Research Question One 145

Table 4.10: The Summaries of Findings for Research Question Two 147

Table 4.11: The Summaries of Findings for Research Question Three 148

Table 4.12: The Summaries of Findings for Research Question Four 150

LIST OF FIGURES

Page

Figure 1.1: The Relationship between Research Questions and Knowledge-building Principles 14

Figure 2.2: Theoretical Framework of this Study 34

Figure 3.1: Summary of Data Collection and Phases of Data Analysis 94

Figure 3.2: First Level Codes for Observation Transcriptions 109

Figure 3.3: First Level Codes for Group Interviews 109

Figure 5.1: A Proposed Model for Teaching and Learning in Economics 184

LIST OF ABBREVIATIONS

CDO	Collateralised Debt Obligation
CLT	Cognitive Load Theory
CGS	Centre for Graduate Studies
CPI	Consumer Price Index
FCSHD	Faculty of Cognitive Sciences and Human Development
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GST	Goods and Services Tax
HEPs	Higher Education Providers
IPR	Interview Protocol Refinement
IS Curve	Investment – Saving Curve
LM Curve	Liquidity – Money Curve
MOHE	Ministry of Higher Education Malaysia
SCT	Social Cognitive Theory
SWF	Sovereign Wealth Fund
UNIMAS	Universiti Malaysia Sarawak
ZPD	Zone of Proximal Development

CHAPTER 1

INTRODUCTION

1.1 Study Background

This thesis is about the knowledge-building and application experience of students in group work in economics. It aims to contribute to the knowledge in addressing the epistemic and practical gaps in teaching and learning economics in higher education.

For over two decades, academicians, researchers, policymakers, and learning institutions have emphasised the importance of "twenty-first-century skills" in the face of economic, environmental, and social challenges. These skills include critical thinking, problem-solving, practical, interpersonal, self-directed learning, information literacy, and functional communication skills (Darling-Hammond et al., 2020). The development of these skills is inclined towards more student-centred pedagogies and practices.

Higher education providers (HEPs) primarily aim to deliver courses that link theoretical knowledge and practical skills to enable graduates to perform effectively in diverse industry settings. This approach will ensure university graduates remain at the cutting edge of an increasingly competitive job market that requires more critical thinking and problem-solving skills. Furthermore, this would prepare graduates with a skill set and knowledge that is future-oriented and adaptable to various industries. To sustain learner engagement and improve graduate attributes within diverse professional curricula, HEPs can contextualise activities for each profession and integrate them into the existing curriculum (Litchfield et al., 2010).

Therefore, the curriculum design of delivered courses is designed by educators in consultation with and accredited through relevant professional bodies and industry groups. The aim is to ensure that the learning outcomes of delivered studies are appropriate. Graduates are competent to adapt to the workplace environment and better prepared for employment (Litchfield et al., 2010; Vardi & Ciccarelli, 2008) by applying up-to-date knowledge instead of commonly used solutions to different situations.

As such, higher education providers have to prepare graduates to deal with complexity, evolving information, and strongly interrelated information. This approach ensures that future practitioners acquire relevant knowledge and skills to apply critical thinking and problem-solving in real-life situations. Notably, using knowledge is linked to creative problem-solving and critical thinking, which are highly valued qualities (Litchfield et al., 2010).

1.2 Learning and Teaching Economics in Higher Education

Economics is a required subject for most undergraduate business courses. Generally, students from other discipline majors like engineering, computing, and sciences may enrol in this subject as an elective as part of their course requirement (Islam & Manaloor, 2012). Ideally, the fundamental ideas underlying teaching economics are to develop analytical thinking skills among students and provide them with insights into the economic and social world (Ormerod, 2003). Zlatkin-Troitschanskaia et al. (2016) concur with Islam and Manaloor (2012), and highlight that the importance of economic knowledge has increased significantly in business, law and engineering courses at the international level in higher education.

Guest and Duhs (2002) surveyed 205 Australian economics graduates who had completed a Bachelor of Economics over the past ten years and asked them how useful they had found various topics and pedagogical approaches in their economics degree since graduation. The graduates commented that the economics syllabus contained too much in too little depth, needed more real-world applications, and focused too little on fundamental concepts.

In an introductory economics subject, students are mainly introduced to fundamental economic concepts relating to the behaviour of individuals, firms, and market structures. Some economic concepts are complex if instructors rely solely on conventional teaching methods (Zhang, 2017) since their content and techniques are drawn and integrated from disciplines, including mathematics, statistics, philosophy, psychology, and history (Allgood et al., 2015). Thus, it requires integrating theoretical skills, calculation, graphs, tables and equations to answer questions (Arsaythamby & Julinamary, 2015) and both verbal and quantitative reasoning that are practical and abstract (Allgood et al., 2015; Johnston et al., 2000).

Based on the study by Forsythe (2010), the heterogeneous group of students refers to students in joint or multidisciplinary programmes who took economics in their first year of study. The economics instructors had to deal with students with varying levels of interest in and aptitude for economics. Hence, the instructors had to determine the relevant subject-specific skills and the range of generic skills that students would be able to learn, enabling them to enhance their employment opportunities in the future.

Similarly, Cameron and Lin (2015) state that students come to their first-year degree courses from various backgrounds. Some may have studied high school economics, yet others may have not gained prior economics knowledge. This finding is congruent with what

is reported by Khoo and Abdullah (2013), who state that economics is an elective course in Malaysia's secondary schools. However, all pre-university students in the arts are required to take economics. As a result, mastering economics is always challenging for pre-university students, especially those who did not study it in secondary school. Differences in prior economic education also challenge higher education teachers in deciding which economics knowledge the students have prepared for their lessons (Happ et al., 2018).

Undeniably, the issues raised above have spurred many effects in teaching and learning this subject. These solutions include implementing a student-centred approach to cultivating students so that they are competent to grasp the discipline knowledge and required skills, considering that the development of these diverse aspects is challenging for students in their early undergraduate years. Consequently, if students do not seem aware of and understand this complexity and the grounded sources of subject matter, this may lead to a gap in their knowledge (Thornton, 2012).

Hence, learning economics can extend beyond teaching theories and concepts in lecture theatres, study halls and textbooks. Significantly, instructors must facilitate students' ability to apply the concepts accordingly by 'plugging' them into real-world contexts (Arul, 2007). Knowledge can be used in various practice settings, from the classroom to the real world. Creating better learning in individuals could be cultivated by providing opportunities to acquire knowledge and skills through dealing with real-world economic problems.

With this exposure, students can formulate their views and be empowered to take responsible action according to the phenomena (Pühringer & Bäuerle, 2019). Moreover, Black and William (1998) observe a shift in the focus of assessment studies from emphasising tests that have a weak relationship to students' learning experiences to focusing on the interactions between assessment and classroom learning.

For learning to occur, context is constantly linked to such occurrence, resulting in teaching and learning strategies that engage learners in authentic contexts. In authentic contexts, where the learning environment closely resembles real-world settings where the knowledge and skills learned can be applied, students interpret and make sense of the learning tasks or activities. This results from the individual or collective act of interpreting an activity (van Oers, 1998). For instance, it is essential to assist students in learning economics by giving students real problems to illustrate an authentic experience of economists' work. This approach enables students to discover relevant information and applicable theories (Sarnikar, 2015).

Furthermore, a profound grasp of concepts and skills acquisition are closely intertwined and should be cultivated in educational settings to prepare graduates for the demands of the modern workforce. Achieving this goal requires transforming the conventional economics classroom, which primarily relies on passive instructive methods, into an active and student-focused learning environment (Davis, 2019).

Based on these justifications, group work is considered and recommended for a student-centred learning approach to enrich the learning experience (Davies, 2009; Elliott & Balasubramanyam, 2016).

1.3 Problem Statement

The research undertaken in this study is prompted by several gaps identified in the existing literature within economics education. Students' struggle to grasp abstract economic concepts (Forsythe, 2010; Islam & Manaloor, 2012; Reimann, 2004) and their inadequate ability to apply acquired knowledge in practical contexts (O'Doherty et al., 2007; Walstad & Rebeck, 2002) have been well-documented. Tang (2003) and Walstad (2001) indicated that

while students exhibit proficiency in classroom assessments, transferring knowledge to real-life scenarios remains a challenge (Hansen, 2001; Tang & Robinson, 2004). This gap is further pronounced by students' inability to connect real-life situations with relevant economic concepts, potentially limiting their application of disciplinary knowledge (Hansen et al., 2002). Real-world learning is typically an opportunity for students to engage in projects or solve problems, allowing them to apply the theoretical knowledge they have acquired in a practical, real-world context (Brundiers et al., 2010). Pühringer and Bäuerle's (2019) study exposes the pedagogic problem stemming from the disconnect between students' real-world exposures and academic economics.

For instance, Guest and Duhs' (2002) studies show that students did not learn fundamental concepts such as opportunity cost, supply and demand, indifference curves, and the Phillips Curve in sufficient depth to be retained over a long period. This inability is due to overemphasising theory in economic courses with little application. Subsequently, graduates perceive these economic concepts as less applicable to their professional and personal lives when entering the workforce. As such, lacking comprehension of procedural knowledge, which acts as the vital link between theoretical understanding and practical application, students may encounter challenges when attempting to employ the knowledge they have acquired in real-world scenarios (Hung, 2006).

In these gaps, the potential of active learning strategies, particularly group work, has garnered attention, but its application in economics education still needs to be explored (Watts & Becker, 2008). While knowledge-building's significance is widely recognised, its investigation has primarily focused on fields such as computing, mathematics, and medical education (Gilbert & Driscoll, 2002; Gunawardena et al., 1997; Palincsar & Herrenkohl, 2002; Scardamalia, 2002; Scardamalia & Bereiter, 2010; Singh et al., 2007). This is

highlighted by Sarnikar (2015), who reviewed science and mathematics education research. Sarnikar's review revealed substantial evidence of students' understanding of core concepts in these fields. Innovative instructional strategies have effectively mitigated the cognitive barriers contributing to these misconceptions. However, it is essential to note that such research in economics remains limited.

In light of these gaps, more empirical evidence is needed in the literature concerning detailed investigation into knowledge-building among economics students during group work at the tertiary level. The studies conducted by Forsythe (2010), Goodman (2010), and Guest (2012) approach group work from different angles but need more comprehensive non-participant observation and interviews. Forsythe's (2010) study centres on student perceptions within a problem-based learning (PBL) environment, where students shared qualitative feedback on their experiences within this context. Conversely, Goodman (2010) explores problem-based learning as a strategy for students to interconnect mathematical and economic knowledge while fostering additional skill development. This research employs action research in an undergraduate classroom setting.

Similarly, Guest (2012) examines the case for integrating Accounting, Finance, and Economics in teaching the Global Financial Crisis (GFC) via PBL. This study also utilises action research within a capstone course in a business degree program. This absence of empirical evidence underscores the need for a study holistically examining the interplay between knowledge-building, practical application, and pedagogical enhancement within economics education.

Within the Malaysian context, research on collaborative work in economics has explored topics like collaborative problem-solving (Khoo, 2008), students' interests (Khoo,

2015), and readiness for group learning (Khoo & Abdullah, 2013). However, these studies have yet to delve deeply into the knowledge-building process in group work.

Addressing these gaps, this study aims to contribute to the existing literature by investigating knowledge-building processes and their transformation during group work among economics students at the tertiary level. This research will shed light on how student-centred activities in group work can synergise learning economics and practical application, bridging the epistemological and practical gaps identified in the literature. Through a comprehensive examination of these dynamics, the study aims to offer insights into enhancing pedagogical strategies that promote meaningful knowledge-building and its real-world application within economics education.

1.4 Research Aim and Research Objectives

This research aims to contribute to the field by shedding light on the intricate interplay between students' epistemological engagement in constructing knowledge and their ability to effectively apply it in real-world scenarios. Through a deeper understanding of these dynamics, the study aims to provide insights into enhancing the pedagogical approaches that foster meaningful knowledge-building and its practical application within economics education at the tertiary level.

The specific research objectives of this study are:

i. To investigate the processes and strategies students employ in knowledge-building during group work.
ii. To examine the productive discourses contributing to intellectual progress in economics.

iii. To analyse the changes and developmental shifts in student knowledge within group work.

iv. To examine how students can apply the knowledge acquired through group work to real-world applications.

1.5 Research Questions

This study aims to answer the following research questions, each addressing its corresponding research objectives.

i. How do students build their knowledge when participating in group work?

ii. What are the productive discourses contributing to intellectual progress in economics?

iii. What changes and developmental shifts occur in student knowledge within group work?

iv. To what extent and in what ways do economics students apply the knowledge acquired through group work to real-world applications?

In essence, this study delves into the targeted research objectives and questions by scrutinising the evolution of student knowledge within the context of group work. Furthermore, the investigation evaluates how this knowledge is practically applied. Table 1.1 below displays the relationship between the problem statement, research aim, objectives and questions.

Table 1.1: Relationship between Problem Statement, Research Gaps, Aim, Objectives and Questions

Problem Statement	**Research Gaps**	**Research Aim: To provide insights into enhancing the pedagogical approaches that foster meaningful knowledge-building and its practical application within economics education at the tertiary level.**	
		Research Objectives	**Research Questions**
Group work has garnered attention in other disciplines, but its application in economics education remains underexplored.	Epistemological gap	To investigate the processes and strategies students employ in knowledge-building during group work.	How do students build their knowledge when participating in group work?
Participants' qualitative insights are not detailed in past empirical studies on knowledge-building in group work.	Epistemological gap	To examine the productive discourses contributing to intellectual progress in economics.	What are the productive discourses contributing to intellectual progress in economics?
There is no detailed investigation of knowledge-building among students taking economics.	Epistemological gap	To analyse the changes and developmental shifts in student knowledge within the context of group work.	What changes and developmental shifts occur in student knowledge within group work?

Table 1.1 continued

Students' inability to connect real-life situations with relevant economic concepts.	Practical gap	To examine how students can apply the knowledge acquired through group work to real-world applications.	To what extent and in what ways do economics students at the tertiary level apply the knowledge acquired through group work to real-world applications?

1.6 Conceptual Framework

The conceptual framework for this study is established upon Scardamalia and Bereiter's (2010) twelve principles, which form the foundation of knowledge-building. The twelve knowledge-building principles are intricately intertwined with economics education, offering a comprehensive framework that aligns with the discipline's pedagogical goals. These principles, ranging from real-world engagement to collaborative learning and constructive use of authoritative sources, resonate with the essence of economics education. Applying these principles ensures students engage with authentic economic problems, critically evaluate theories, and collaborate to construct new insights. The principles enhance students' ability to connect economic concepts with real-world scenarios meaningfully by fostering epistemic agency, promoting diverse perspectives, and facilitating discourse.

Furthermore, economics students can adopt a more integrated and active learning style by connecting these twelve knowledge-building principles to the subject. They can engage in ongoing dialogues, critically analyse, and take charge of their intellectual growth.

To cultivate educational systems that build human capacity for innovation and knowledge creation, there needs to be a shift from merely framing schooling as “preparing students for the knowledge society” (Tan et al., 2021, p. 2244). Instead, educational systems can focus on the relationship between economic education and knowledge-building by examining future economic opportunities and integrating relevant skills and competencies into the curriculum to prepare students for a dynamic economic landscape. For example, economics and other domains such as politics, family, and education contribute to a holistic understanding of social structures. These domains facilitate students' knowledge-building process by connecting theoretical concepts to real-life contexts (Rusznyak, 2020).

Studying discourse is fundamentally crucial because discourse facilitates knowledge-building (Lin et al., 2014). Intellectual progress involves crucial epistemic beliefs that drive conceptual change and self-questioning in students, promoting a deeper understanding of knowledge as changeable and improvable (Lee, 2006). This improves students’ comprehension of economic ideas and prepares them to actively participate in and contribute to the larger economic community.

Moreover, knowledge-building focuses on student agency and shared responsibility, involving students directly in knowledge work through the continuous development of ideas, which is the core practice of knowledge creation (Chan & Tan, 2023). Hence, these principles are practical in guiding educators in designing instructional strategies that encourage inquiry, exploration, and the development of a deep understanding of economic phenomena. Integrating these principles within economics education enriches the learning experience and empowers students as active knowledge builders. The details of these principles will be discussed in Chapter 2.

Figure 1 illustrates the relationship between the research questions and Scardamalia and Bereiter's (2010) knowledge-building principles. The research questions reveal epistemological gaps by examining variations in students' knowledge-building processes, the discourses contributing to intellectual progress, developmental shifts in student understanding within group work, and the application of acquired knowledge to real-world scenarios. Research Question One is related to knowledge-building principles, including fundamental ideas and authentic problems, epistemic agency, community knowledge, democratising knowledge, and the constructive use of authoritative sources. Research Question Two pertains to knowledge-building discourse. Research Question Three involves improvable ideas, idea diversity, and symmetric knowledge advancement. Research Question Four addresses rise above, pervasive knowledge-building, and concurrent, embedded, and transformative assessment.

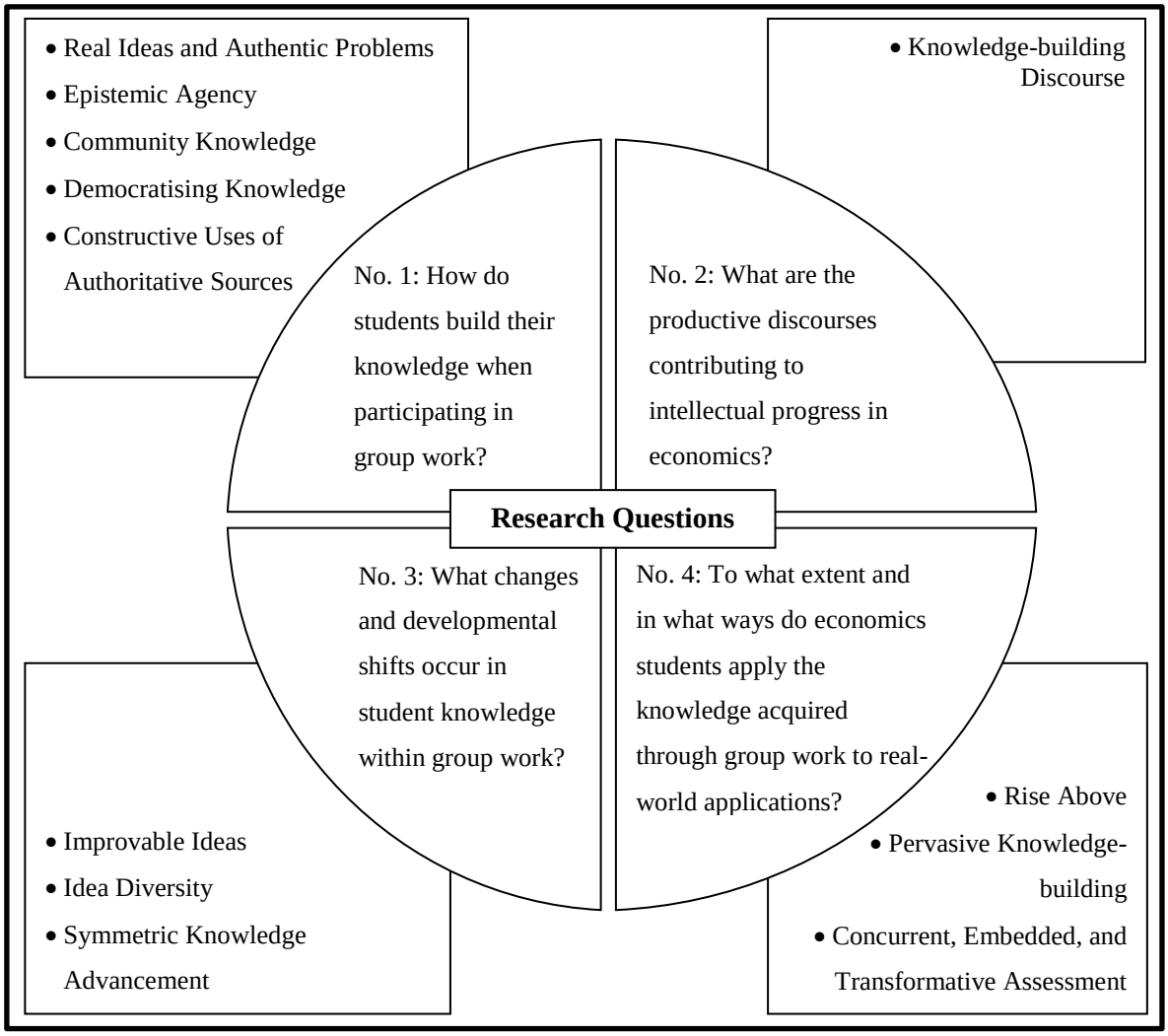


Figure 1.1: The Relationship between Research Questions and Knowledge-building Principles

1.7 Significance of the Study

As outlined under the research objectives, this study sought to provide insights into enhancing the pedagogical approaches that foster meaningful knowledge-building and its practical application within economics education at the tertiary level. As such, this study would be beneficial to provide a better understanding and valuable insights into students' knowledge-building and application experience in group work and contribute to the field of learning sciences by proposing a model capable of optimising learning outcomes in

economics education addressing issues related to conceptual understanding and the application of knowledge to real-world situations.

1.7.1 Epistemological Significance

This study holds critical significance in addressing the epistemological gap by profoundly examining the intricate processes through which students actively construct knowledge within the context of group work in economics education at the tertiary level. The study sheds light on how knowledge is formed, shaped, and advanced by exploring students' specific strategies and methods during group work. This investigation contributes to the field of epistemology by uncovering the dynamics of knowledge construction in a collaborative setting and by offering insights into the epistemic processes involved.

Furthermore, this study delves into what changes and developmental shifts occur in student knowledge within group work in economics education. The study contributes to a deeper understanding of the epistemological changes due to group work experiences by investigating how students' understanding transforms and evolves during collaborative interactions. This scope extends beyond the current research landscape, primarily focusing on computing, mathematics, medical science, and medical education (Gilbert & Driscoll, 2002; Gunawardena et al., 1997; Palincsar & Herrenkohl, 2002; Scardamalia, 2002; Scardamalia & Bereiter, 2010; Singh et al., 2007). As a result, the findings from this study introduce a novel perspective to the context of economic education, shedding light on how student participation in group work can foster the application of knowledge in addressing real-world challenges.

In 2005, the Malaysian Qualifications Agency (MQA) assumed the role of ensuring quality assurance in higher education and introduced the Malaysian Qualifications Framework (MQF) (Grapragasem et al., 2014). Central to the MQF is a learning outcome

domain focusing on discipline-specific knowledge. Within this framework, graduates are expected to showcase their mastery of the subject and the ability to comprehend pertinent concepts (Malaysian Qualifications Agency, 2011; 2018). This highlights an epistemological gap, where the emphasis on disciplinary expertise needs to be complemented by a practical understanding and application of acquired knowledge.

Additionally, the Ministry of Higher Education Malaysia (MOHE) conducted a study in 2010 to envision the country's future in economics and management education. Addressing concerns raised by employers, it became evident that a disproportionate focus on academic knowledge stemmed from the university curricula at the expense of practical knowledge (Ministry of Higher Education, 2010). This emphasises the gap between theoretical understanding and practical application, underscoring the need to bridge this divide within economics education.

1.7.2 Practical Significance

From a practical perspective, this study holds substantial implications for educators and curriculum developers. By comprehensively understanding the specific processes and strategies that students utilise to construct knowledge during group work, educators can tailor their pedagogical approaches to guide and facilitate these processes effectively. The findings offer practical insights into optimising group work activities in economics education to enhance knowledge acquisition and construction.

Additionally, the study addresses the practical gap by exploring the manifestation of changes and developmental shifts in student knowledge within group work contexts. This understanding is crucial for educators and institutions aiming to create impactful learning environments that foster transformative changes in students' understanding and application of knowledge.

Furthermore, the study investigates how economics students at the tertiary level can apply the knowledge acquired through group work to real-world applications, aiming to bridge the gap between academic learning and practical experience. Hopefully, the findings will contribute to designing practical group work activities that enhance theoretical comprehension and equip students with the skills to apply their knowledge effectively beyond the classroom. This practical inquiry responds to Pühringer and Bäuerle's (2019) study, highlighting the pedagogical issue arising from the disparity between students' real-world experiences and academic economics.

Reflecting the practical gap, the government of Malaysia, through the Ministry of Education, designed the Malaysia Education Blueprint 2015-2025 (Higher Education) (Ministry of Higher Education, 2015). This blueprint mandates that higher education institutions incorporate seven essential soft skills into their undergraduate programs. These skills encompass communication, critical thinking, teamwork, lifelong learning, entrepreneurship, ethics, morality, and leadership. The blueprint aims to achieve a harmonious equilibrium between knowledge and skills, ethics and morality. It emphasises the pivotal role of students in higher education being armed with pertinent disciplinary knowledge and the capacity to harness, integrate, and practically apply the knowledge they have assimilated (Ministry of Education Malaysia, 2015).

1.7.3 Theoretical Significance

The theoretical significance of this study lies in its ability to empirically demonstrate how the integration of Vygotsky's Sociocultural Theory (1978), Piaget's Social Constructivism (1970), and the Self-regulated Learning Process (Zimmerman, 2015) can be effectively applied in the context of group work for knowledge-building and application in economic education.

This study is particularly noteworthy because it bridges the gap between theoretical frameworks and their practical implementation. It demonstrates how these theories can be harnessed to foster collaborative knowledge-building and meaningful student learning experiences. By showcasing students' ability to connect classroom knowledge with real-world economic issues, this study offers educators and instructional designers a blueprint for enhancing the quality of education in economics and related disciplines. Ultimately, this study's theoretical significance lies in its potential to reshape pedagogical practices and inspire innovative approaches to teaching and learning. It prioritises active engagement, critical thinking, and the development of well-rounded, socially-aware graduates. Despite the underexplored application of active learning strategies, particularly group work, in economics education (Watts & Becker, 2008), this study opens avenues for exploring and implementing such strategies.

This study adds to the literature exploring the effectiveness of these pedagogical approaches by providing concrete evidence of how these theories can be practically implemented to enhance students' learning experiences.

1.8 Definition of Terms

The critical terminologies used in this research have their specific meaning operationalised to fit this research and their conceptual definitions based on existing literature.

1.8.1 Discourse

In their research, Knight and Littleton (2015) use the terms “dialogue” and “discourse” interchangeably. In this research, discourse means any verbal communication among group members.

1.8.2 Group Work

Group work is “an educational mode that promotes learning and socialisation among students” (Forslund Frykedal & Hammar Chiriac, 2018, p. 183). This research defines group work as students collaborating to accomplish a graded assessment based on contemporary real-world economic issues.

1.8.3 Knowledge-building

Knowledge-building is defined as a social process focusing on producing and continually improving ideas of value to a community (Scardamalia & Bereiter, 2003). Hmelo-Silver and Barrows (2008, p. 48) explain that knowledge-building “involves increasing the collective knowledge of a group through social discourse”. In brief, knowledge-building means improving and enhancing ideas among students.

1.8.4 Knowledge Application

Knowledge application involves utilising acquired knowledge to identify suitable situations for its practical application and effectively using it (Cadiz et al., 2009).

1.8.5 Developmental Shifts

Developmental shifts encompass intermental processes, which involve interactions and collaborations among individuals within a social context, and intramental processes, which represent distinct cognitive operations within an individual's mind, aiding in the organisation and comprehension of information gathered through intermental interactions (Vygotsky, 1978).

1.8.6 Intellectual Progress

Intellectual progress encompasses three types of economic conceptual change: fundamental conceptual change, disciplinary conceptual change, and procedural conceptual change (Davies & Mangan, 2007).

1.9 Chapter Summary

In this chapter, the study aims to contribute to the field by investigating the complex interrelationship between students' epistemological engagement in knowledge-building and their aptitude for applying this acquired knowledge in real-world situations. This dual focus reflects the study's commitment to bridging the gap between theoretical comprehension and practical application within the context of economics education at the tertiary level. By threading together these threads of investigation, this study enriches the academic discourse on knowledge-building and application and offers valuable guidance for educators, curriculum designers, and policymakers. Ultimately, this chapter serves as a prelude to a deeper exploration of the intricate relationship between epistemological engagement and practical utilisation, showcasing the transformative potential of enhanced pedagogical strategies in economics education. This chapter underscores the research's twofold objective of comprehending the intricate connections between knowledge-building and application while spotlighting the transformative potential of enhanced pedagogical strategies. The subsequent chapters will delve deeper into the literature review, research methodology, findings, and discussion, culminating in a comprehensive exploration of the complex interplay between epistemological engagement and practical utilisation within economics education.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

In education, the acquisition and application of knowledge are paramount, particularly in fields as intricate as economics. Learning economics entails grasping theoretical concepts, comprehending their real-world implications, and effectively applying them. As students master economic principles, it becomes evident that achieving a deep understanding and practical competence is not without challenges.

The intricate interplay between theoretical comprehension and practical application has been a topic of great significance in education. Students' ability to translate theoretical knowledge into real-world scenarios is often an indicator of the efficacy of educational strategies. While research in diverse fields has illuminated the pathways to bridging this gap between theory and application, the discipline of economics has yet to be explored in this context.

2.2 Theoretical Foundation of this Study

The theoretical foundation of this study is elucidated here within the context of economics education. To establish the theoretical underpinning pertinent to economics learning and to validate the selection of Sociocultural and Social Constructivism Theories as appropriate theoretical frameworks for this study, studies conducted by Ford and Leclerc (2000), Joshi and Marri (2006), Stefanou et al. (2007), and Taar and Palojoki (2022) were examined.

Ford and Leclerc (2000) explored constructivist learning within college-level economics education. Their exploration centres on the constructivist educational theory, emphasising that genuine and internalised learning occurs when students are tasked with creating their meanings rather than merely reproducing external information. This approach necessitates student engagement, making the learning process active and participatory in knowledge and understanding formation.

Moreover, Joshi and Marri (2006) emphasised that constructivism offers a suitable method for instructing and learning within economics education. This is because economics concepts such as scarcity, markets, and reserve banking possess tangible real-world implications, and students can augment their comprehension by actively immersing themselves in the practical application of these concepts.

Furthermore, Stefanou et al. (2007) conducted a study focusing on integrating learning theories and economic decision-making. They identified two significant challenges in this process: firstly, understanding how individuals acquire new knowledge, and secondly, translating this knowledge into practical actions. They introduced the concept of viewing the learning process as shared decision-making, drawing from Vygotsky's Sociocultural Theory that aligns with Social Constructivism, wherein learners actively collaborate, interpret, and organise information to achieve a shared conceptual understanding. In economics, learners are active participants and beneficiaries of the learning process. This perspective suggests that the learning outcome depends on the level of cognitive engagement from passive to active and social engagement from individual to social within the learning process.

Taar and Palojoki (2022) explored the correlation between home economics education and 21st-century skills (namely critical thinking, creativity, communication, and collaboration) within social learning. Their study recognised the potential inherent in

students' collaborative discussions as they engaged with diverse group members, honing essential skills for navigating the modern world's complexities. Drawing on Vygotsky's Sociocultural framework, they emphasised students' verbal interactions and language utilisation as instrumental tools within an educational context. Additionally, their investigation delved into inter-thinking, providing insight into language's role in shared thinking while tackling learning tasks that necessitate on-the-spot thinking within home economics lessons.

2.2.1 Sociocultural Theory

Learning in Vygotsky's Sociocultural Theory emphasises social interaction and activity in knowledge-building and the meditative role of tools in historical and cultural settings in which knowledge-building occurs. The use and meaning of tools are learnt in interaction with others at the interpersonal level, and then they are internalised as tools at the intra-level. For example, certain concepts are re-externalised in the new act of sense-making, as in the case of collaborative knowledge-building, where new ideas or understandings are built (Arvaja, 2005). Hence, learning is situated in a collaborative knowledge-building activity and exhibited in an ongoing process at the group level (Arvaja, 2005; Arvaja et al., 2007).

Intending to address the nature of children's meaning-making processes, Vygotsky analyses the strategies developed by children to make meaning by acquiring and using language. The fundamental tenet of dialectical logic is that nothing is constant but changes along with the processes (Mahn, 2012), and human dialogues are both dense and rich in content (Chi, 2009).

Vygotsky (1978), as cited in Mercer and Howe (2012, p. 13), describes that the transformation of children's thinking is caused by language acquisition and its use from a

sociocultural perspective. Language is a cultural tool for developing and sharing knowledge within a community or society and a psychological tool for structuring individual thought processes and content. Intermental social and interactional activity is claimed to create significant intramental individual and cognitive capabilities. This transformation indicates that intermental and intramental are strongly interrelated. Mainly when children interact and become involved in shared activities that develop new understandings and ways of thinking later. Therefore, the acquisition and use of language significantly impact both individual and collective thinking from a sociocultural perspective.

Furthermore, this theory also asserts that human intellectual development is a cultural process that involves people's changing participation in cultural activities. This theory is congruent with the claim that knowledge is not solely constructed within the individual's mind but is the interaction within a social context that involves learners sharing and building their ideas and beliefs (Rogoff, 2003).

Vygotsky (1978) identifies that the development of individual capabilities is evident in social environments where support is given, affected by language and cultural exchanges, and the influence of experience on the content that children are willing to learn, especially when the assistance of a more expert other within their zone of proximal development (ZPD). ZPD is "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86), particularly of collaborative group work where students work together, leveraging their collective knowledge and skills to solve problems and complete tasks within their ZPD. Scaffolding has evolved beyond its traditional boundaries of teacher-student or parent-child interactions and encompasses peer interactions (Ge & Land, 2003). As such, ZPD delineates

the gap between a learner's capabilities and what they can achieve with guidance from a more knowledgeable individual (van de Pol et al., 2019).

Savery (2006) reported that participants exposed to a new learning environment require significant instructional scaffolding and metacognitive guidance. This exposure supports their development of problem-solving, self-directed, and teamwork skills to a level of self-sufficiency until the scaffolds are removed.

Under certain circumstances where unfamiliar ideas or new situations may cause students to experience a sense of disequilibrium, with the placement of the right supports to aid students in understanding the experience, more learning can be inspired through their need to resolve uncertainty through discovery. Typically, students work in small groups during learning activities, and they serve as the primary resource for each other, the notion of sharing and gathering information as needed (Jang, 2007).

Based on van Oers' (1998) terminology, the essential element for any critical aspect of all learning focusing on student participation in ongoing activities is contextualising an activity set that consists of an individual or social act of interpretation of such activity. This terminology reflects the essence of instrumental and intramental processes of Sociocultural Theory.

Intermental processes encompass the interactions and collaborations among individuals within a social context. These involve communication, negotiation, and shared interpersonal activities, contributing to the exchange of information and ideas (Vygotsky, 1978). Conversely, intramental processes pertain to a person's internal cognitive activities occurring within the mind. These processes encompass internalised thought, problem-solving, decision-making, and other mental activities. Intramental processes represent

distinct cognitive operations within an individual's mind, aiding the organisation and comprehension of information gathered through intermental interactions (Vygotsky, 1978).

2.2.2 Social Constructivism Theory

Piaget's Social Constructivism Theory emphasises the integration of new information with prior knowledge for active knowledge-building among learners. Jean Piaget has written extensively on this view of knowledge development, including his investigation of children's knowledge development process (Sarnikar, 2015). According to Piaget (1970), to deal with new information, a learner seeks to fit this further information into pre-existing ideas or alter pre-existing ideas based on the latest information received.

Two critical underlying processes resulting in conceptual development from Piaget (1970), as cited in Kazak et al. (2015), are assimilation and accommodation. Incorporating the world's new experiences and perceptions into an existing scheme refers to assimilation, whereas adapting the current method to a new structure is called accommodation. Hence, both assimilation and accommodation function in a dialectical relationship.

When the learner's experience does not fit expectations, the new venture does not work with the learner's prediction based on the existing schema, and disequilibrium arises. Naturally, it is considered that learners always seek equilibrium whenever disequilibrium emerges. Disequilibrium generates cognitive conflict originating from divergent opinions and peer interaction resolutions, prompting the learners to explore possible approaches for conflict resolution (Sarnikar, 2015). Hence, accommodation occurs to stabilise or re-establish the equilibrium.

The same perspective aligns with Leita's (2000) description, wherein exploring Social Constructivism Theory reveals that identifying disparities between individuals' pre-

existing worldviews and conflicting information triggers the onset of socio-cognitive discord. Such discord emerges during interactions between learners who hold divergent interpretations of events (Mercer, 1996), often resulting in the reshaping or transformation of their knowledge framework.

From an individualistic perspective, firstly, learning is regarded as the occurrence within the individual's mind caused by external stimuli, such as interactions with other individuals, the physical environment, and the social environment (Sarnikar, 2015). People process information and construct knowledge from their interactions with external stimuli. Secondly, when complex social interactions lead to knowledge-building that relies on social context, such knowledge-building is impossible without social interactions. This perspective means that under this view, a social participatory context is vital for learning as this process is not an occurrence within the individual's mind (Sarnikar, 2015). In a social participatory context, learning is facilitated through active engagement and collaborative interactions with others. For example, this social participatory context can be done through group discussion, group work, and group members' feedback and review. In such contexts, learning is a social and interactive process that relies on individuals' active engagement and participation within a social community.

2.2.3 Social Cognitive Theory (SCT)

Albert Bandura's Social Cognitive Theory (1977), which he refined in 1986, addresses an agentic perspective on human development, adaptation, and change. This theory differentiates between three modes of agency: personal agency, proxy agency, and collective agency.

Personal agency is defined as people's beliefs on attaining targeted performance levels. They believe that they can exercise influence over incidents affecting their personal

lives. People's beliefs about their efficacy can be developed by four primary sources of power (Bandura, 1994). They include mastery experiences, seeing people like oneself manage tasks successfully, social persuasion that one can succeed in mastering given activities and implications from bodily and emotional states that indicate personal strengths and weaknesses. The stronger the perceived self-efficacy people set, the higher the goals they aim for themselves. Hence, their persistence and commitment to attain these goals is firmer. Subsequently, high self-efficacy demonstrates how resilient people cope with challenges in accomplishing their tasks (Bandura, 1994).

Secondly, people may not have immediate control over incidents affecting their personal lives. Under these circumstances, they may seek assistance from and rely on those with access to resources or expertise to act based on our directive to attain their desired outcome. This agency is known as the exercise of proxy agency (Bandura, 2001).

Under the third agency – collective agency, people share beliefs, intentions, knowledge, and skills with their members, and their communication is interactive, coordinated, and dynamic. This agency means people seek to achieve their desired outcome through collective effort and mutually interdependent action (Bandura, 2001).

2.2.4 Cognitive Load Theory (CLT)

Sweller (1994) made the Cognitive Load Theory famous. This theory provides guidelines for presenting information to encourage learning activities that optimise intellectual performance. It consists of three types of loads: intrinsic, extraneous, and germane (Sweller et al., 1998).

To understand the content of the information presented, learners must process instructional information in working memory. However, some of the working memory is

overloaded by the intrinsic nature of the data. This kind of load is called ‘intrinsic cognitive load’. It is imposed by the primary manner of the learner's information to achieve their learning goals regardless of the instructional procedures used (Sweller et al., 2011).

Secondly, the nature of the instructional design used to present the information content can also impose a cognitive load. Concerning the instructional design, when the cognitive load should be avoidable and extraneous to the learning goals, it is called ‘extraneous cognitive load’. This load exists due to the instructional procedures used (Sweller et al., 2011).

Lastly, the cognitive load imposed by the intrinsic nature of the content information and instructional procedures in which the information is presented must be dealt with by working memory with resources allocated to these two sources of cognitive load. Importantly, resources devoted to the limitation imposed by the intrinsic nature of the content information are pertinent to learning. These are called ‘germane resources’ (Sweller et al., 2011). The increase in germane load is likely to assist learning and support the retention of information (Paas & van Merriënboer, 1994).

Linking CLT to SCT involves examining how these two theories can intersect and influence each other within the context of learning and cognitive processes. As suggested by the CLT, the appropriate management of cognitive load can impact learners' self-efficacy, agency, collaborative efforts, and goal attainment, as SCT emphasises.

2.2.5 Self-Regulated Learning Process

Zimmerman (2015) develops a three cyclical-phases model of self-regulated learning. These are described as self-regulation phases consisting of forethought, performance, and self-reflection. The first phase is forethought, which consists of

foreseeable efforts to learn with self-motivational beliefs, such as self-efficacy, outcome expectations, intrinsic interest, and task analysis skills, such as planning, goal setting, and strategy choice. The second phase is performance. It encompasses optimising learning efforts through time management, imagery, self-verbalisation, and self-observation processes. Lastly, the final phase is known as self-reflection. It consists of processes that result from efforts to learn and understand the personal implication of outcomes, which include self-judgement processes, such as self-evaluation and attributions, and self-reactive processes, such as self-satisfaction and adaptive or defensive inferences.

From a self-regulated learning viewpoint, the focal point is students' self-initiated processes in developing their learning methods and environments. These processes include goal setting, planning, learning approaches, self-reinforcement, self-recording, and self-instruction. Such focus has changed from viewing students' learning abilities and instructional environments as fixed entities; instead, student learning becomes a self-initiated and proactive activity and is no longer a concealed effect of teaching experiences (Zimmerman, 2015). As such, motivational processing can be the focal point of efforts by students to plan, monitor, control, and reflect. These efforts increase students' attention, motivation, and persistence, leading to better learning outcomes (Järvelä & Järvenoja, 2011).

As part of self-regulated learning, metacognition enhances students' sense of agency. Students can respond positively to feedback, set goals, and handle their progress towards these goals. By applying metacognitive strategies, more and less competent learners can be identified. Strong learners demonstrate an essential aspect of deep engagement in the learning process. Their learning process is explained, and reasoning for taking specific steps or coming to an inevitable conclusion is articulated (Chi et al., 1989, cited in Darling-Hammond et al., 2020). It can be summarised that self-regulation occurs when students

regulate their learning process without any apparent intention of influencing others' metacognition, motivation or emotion (Ucan & Webb, 2015). On top of that, students have to acquire knowledge and also learn to regulate the process of acquiring knowledge in collaborative learning (Elbers & Streefland, 2000).

Learners' active construction of knowledge, skills, and understanding is first carried out instead of passively receiving, absorbing, assimilating, or memorising information others provide. The social process of learning then follows it. Meaning is constructed, and the learner's thinking is revised through interaction with others, including negotiating and interpreting the perspectives, knowledge, and behaviour within their context, as learners do not develop meaning independently (Webb & Mastergeorge, 2003). Educators should understand the circumstances and how definitions and knowledge are structured together (Kumpulainen & Kaartinen, 2000).

Besides the self-regulation discussed earlier, Ucan and Webb (2015) review the literature and synthesise that group members can engage in two regulation processes: co-regulation and shared regulation. Co-regulation represents episodes in which the regulatory processes aim to influence others' metacognition, motivation, or emotion to support and guide others' learning.

Furthermore, co-regulation stresses the gradual appropriation of sharing common problems and tasks through interpersonal interactions. Co-regulation could be done through scaffolding and intersubjectivity, sharing ideas, facts, and explanations of plans, goals, and activities (Järvelä & Järvenoja, 2011). As such, co-regulation can stimulate the group members to reflect upon and clarify their thinking and facilitate new understanding by revising their initial conceptions (Ucan & Webb, 2015). Group members participating in co-regulation probably contributed to the advancement and refinement of their self-regulated

learning competencies, resulting in overall improved skills throughout the project's duration (DiDonato, 2013).

Meanwhile, shared regulation occurs when students share and regulate their collective activity to achieve a shared goal. The collaborative process of sharing can lead to collective knowledge creation (Järvelä & Järvenoja, 2011). This shared regulation is due to the context of group work, and group members know that they have to work together in different situations and apply what they have learned to new situations. It is vital for groups in complex environments, mainly dealing with complicated and challenging tasks (London & Sessa, 2007).

2.2.6 Theoretical Framework

The theoretical framework utilised for this study focuses on the Sociocultural Theory (Vygotsky, 1978) and Social Constructivism Theory (Piaget, 1970), together with the integrated components of the Self-regulated Learning process (Zimmerman, 2015). These two theories are perceived to support the social interactions occurring between participants. Their shared interactions will help lay the groundwork for knowledge-building in a group work setting.

The fundamental research of this study was not based on SCT and CLT. The rationale is that the SCT focuses on personal agency, where people believe they can impose impacts over incidents that influence them instead of how social context influences their behaviour. Secondly, the CLT focuses on the information presented, instructional design, and appropriate resources. However, the research context of this study is based on group work that focuses on reciprocal and interdependent relationships and social interaction between group members. These two theories are deemed not suitable for this research context. Connecting CLT with SCT entails exploring their potential synergies and reciprocal effects

on learning and cognitive functioning. As proposed by CLT, effective control of cognitive load can shape learners' self-efficacy, agency, collaborative endeavours, and achievement of goals, as emphasised within SCT.

More importantly, student learning based on the Sociocultural Theory focuses on social interaction and interactive knowledge-building. As such, this theory is appropriate for this research context to investigate knowledge-building experiences from students' perspectives in group work. Furthermore, the meditative role of tools, particularly language, is anticipated to influence the group process. When students interact with other group members, that may lead to an incremental process and cause significant impacts on the intramental process.

Besides that, the Social Constructivism Theory highlights integrating new information with learners' prior knowledge in knowledge-building. This integration will be showcased in the group work context when cognitive dissonance is exhibited between group members. Members seek to alter the newly received information to fit their pre-existing ideas or adjust them to suit the new information received.

Moreover, the focal point of the Self-regulated Learning process is based on learners' self-initiated processes in goal setting, planning, learning approaches, self-reinforcement, self-recording, and self-instruction. This learning process is expected to blend well with both proposed theories in this research context by considering that the learners self-initiate the formation of their groups and regulate their activities to complete their group assessments. Throughout this group work, there is an expectation that students will be able to connect and apply their knowledge to real-world issues, as presented in the following theoretical framework in Figure 2.1.

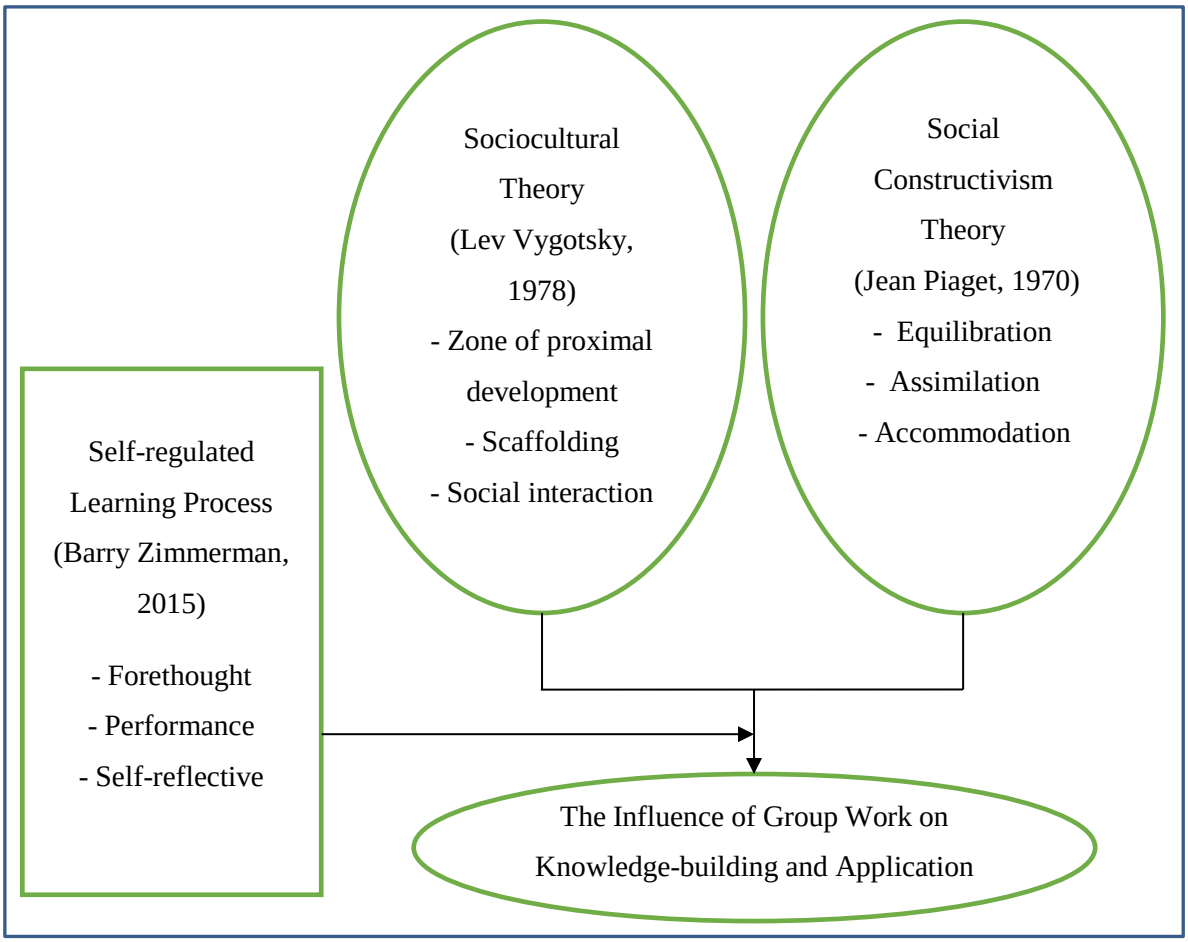


Figure 2.1: Theoretical Framework of this Study

2.3 Economic Knowledge and Proficiencies

Knowledge has been studied since philosophers Plato and Aristotle from the epistemological perspective. It focuses on defining the nature and scope of expertise and acquiring learning (Ting et al., 2016). The beliefs and theories individuals come to hold about knowledge and knowing have particularly interested psychologists concerned with education and instruction (Hofer, 2004).

Generally, the hierarchies of the construction of knowledge in an economics subject start from mastering the basic economic concepts to attaining higher-ordered thinking, creativity, and synthesis of knowledge (Steinemann, 2003; Walstad, 2001). It is anticipated

that if students have a sound understanding of basic economic concepts, they should retrieve meaning from them and build interconnectivity between related concepts. Also, this will help to improve student satisfaction when studying economics by applying theories to real-world and current issues (Reimann, 2004).

Additionally, Hansen (2001, pp. 232-233) articulates six expected proficiencies concerning economics. His descriptions of a hierarchy of proficiencies are presented in Table 2.1 below. The first two proficiencies involve relatively low levels of cognitive activity, basically assessing and displaying command of existing economic knowledge. Next, proficiencies three and four require interpreting and evaluating existing economic knowledge, including economic data.

The fifth and sixth proficiencies involve high levels of cognitive activity. They include applying existing economic knowledge to deal with economic problems, issues, and policies and creating new economic knowledge-building on the previous five proficiencies.

Hansen's (2001) sequence of the expected proficiencies mirrors Bloom's (1956) taxonomy, where the proficiencies are constructed appropriately and meaningfully in economics. However, empirical results discovered a significant gap between students' study experience of economics and the real-world phenomenon that causes students to fail to connect with reality (Pühringer & Bäuerle, 2019). This gap indirectly implies that attaining the fifth and sixth proficiencies is least likely to happen in real life.

Table 2.1 (below) shows that expected economic proficiencies and knowledge-building differ. The expected economic skills listed by Hansen (2001) may help lay the groundwork for knowledge-building in economics education, but they differ from the knowledge-building process. The knowledge-building process includes more dynamic and

interactive elements, such as collaborative discourse, critical inquiry, and the communal construction of new information. However, proficiency provides a starting point for students to engage in knowledge-building activities. The expected economic proficiencies differ from other contents because they aim to equip students with the knowledge and skills to understand and analyse economic issues and contexts and make wise judgements in practical situations.

Table 2.1: Expected Economic Proficiencies

No.	Proficiency	Description
1.	Access existing economics knowledge	Retrieve information on particular topics and issues in economics.
2.	Display command of existing economics knowledge	Explain key economic concepts and describe how these concepts can be used.
3.	Interpret existing economics knowledge	Explain and evaluate what economic concepts and principles are used in economic analyses.
4.	Interpret and manipulate economic data	Explain how to understand and interpret numerical data found in published tables.
5.	Apply existing economics knowledge	Prepare an organised and clearly written analysis of a current economic problem.
6.	Create new economics knowledge	Formulate questions that illuminate a new economic issue that needs to be researched.

(Source: Hansen, 2001, pp. 232-233)

Hansen's expected economic proficiencies provide a roadmap for enhancing students' ability to bridge the epistemological gap. These proficiencies cover various aspects of knowledge acquisition, interpretation, manipulation, and application. Examining these proficiencies concerning the epistemological gap in the literature highlights the issue where students might possess a surface-level understanding of economic concepts but need help to

apply this knowledge in real-world scenarios effectively. In this context, Hansen's expected economic proficiencies provide a framework for bridging this gap, aiming to equip students with the skills necessary to link theoretical understanding with practical application.

Within a society that revolves around the development of technology, globalisation, and industrialisation, the responsibilities of the community are handled only appropriately with sufficient economic and financial knowledge and skills among students (Asano & Yamaoka, 2015). In this regard, students must keep abreast of current issues and use their economic knowledge concisely because "students should also never lose sight of the real-world relevance of the material study…" (Elliott & Balasubramanyam, 2016, p. 4). The statement emphasises the value of students staying current on economic topics and appreciating the application of their economic knowledge in the real world. Students can improve their critical thinking abilities, gain a deeper understanding of economic ideas, make wise judgements, and become ready for occupations where having a grasp of economics is crucial by staying informed and applying economic principles to real-world situations.

While investigating various changing aspects in the teaching of economics in an Australian university, Alauddin and Butler (2004) discovered that there seemed to be a broad agreement among academic staff and students on what constitutes good teaching and learning in economics. Both staff and students acknowledged that the practical applicability of the course materials is an essential element of good teaching and learning in economics. Particularly, students in pre-requisite and master courses in economics preferred to apply the course materials and illustrate materials with real-life examples. As such, a student-centred learning approach for enriching the learning experience, that is, group work, is essential to demonstrate the details of the group process conducted in economic education.

Meanwhile, Li and Campbell (2008) found that lecturers did not consider students' prior learning, perceptions, expectations, attitudes, personal feelings and subjectivity in setting up cooperative group learning activities. As a result, students in their study felt discouraged when participating in a group activity. In this context, instructional design should incorporate strategies and activities to elicit student thinking and prior knowledge (Sarnikar, 2015).

Economic knowledge and proficiencies illuminate the cognitive processes, socio-cognitive conflicts, role of discourse, and ultimate application of knowledge that this study aims to explore. By delving into these proficiencies, this study contributes valuable insights into the dynamic interplay between economic education, group work, and knowledge-building.

2.4 The Practice of Knowledge-building

Lin et al. (2014, p. 124) define knowledge-building as a group of learners carrying out social negotiation processes to create and improve ideas constantly. This definition of knowledge-building is an embracement of illustrations by Scardamalia and Bereiter (2003) and Hmelo-Silver and Barrows (2008), as presented in Chapter One, where Lin et al. (2014) include the social negotiation process. This embraced definition also mirrors Cross (1998, p. 5), which states that knowledge is co-constructed by "working together, not just cooperatively but interdependently" and "learners actively build knowledge as they shape and build mental frameworks to make sense of their environments."

On the other hand, van Aalst and Chan (2007) highlight the importance of collaboration in knowledge-building. They assert that collective cognitive responsibility and

knowledge frontier enhancement have a much more significant impact than just working with others.

According to Scardamalia and Bereiter (2010), twelve principles underlie knowledge-building. These principles help foster the social dynamics involved in knowledge-building environments. They are fundamental ideas and authentic problems, improvable ideas, idea diversity, rise-above, epistemic agency, community knowledge, democratising knowledge, symmetrical knowledge advancement, pervasive knowledge-building, constructive use of authoritative sources of information, knowledge-building discourse, and concurrent, embedded, and transformative assessment. These principles support the transformation of classroom learning into a knowledge-building community.

The first principle emerges from fundamental ideas and authentic problems. This principle allows participants to understand the real world while researching and investigating authentic issues. Also, this principle is congruent with findings of the research carried out by Pühringer and Bäuerle (2019) that student exposure to real-world economic problems has an impact on promoting a sense of empowerment and responsibility, encouraging students to take ownership and act accordingly. Through knowledge-building, students become empowered to view "their work as part of the civilisation-wide effort to advance knowledge frontiers" (Scardamalia & Bereiter, 2006, p. 98).

The second and third principles relate to improvable and diverse ideas that focus on progressive inquiry, refinement of ideas, and knowledge advancement. Students improve constructive ideas and acquire knowledge when their original ideas are the initial formulation of inquired subjects that lack scientific or well-based explanations. These improvements are valuable and meaningful contributions to learning (Lin et al., 2014).

Next is the fourth principle, which is about rising above that requires learners to work toward more inclusive principles to achieve greater coherence and higher-level formulations of problems. As an expected action, this requires students to learn and work with diversity and complexity to attain new findings (Scardamalia & Bereiter, 2010) by synthesising old ideas and pointing out new challenges to understanding (Hong et al., 2011).

The fifth principle focuses on epistemic agency, which explains that learners display a certain level of individual and collective control over goals, strategies, resources, and results evaluation as part of their knowledge-building process (Scardamalia & Bereiter, 2006). By dialogising ideas, learners can tackle emerging understanding that inspires more meaningful questions and solve authentic problems. As such, student interactions will determine the extent of elaboration and enhancement of ideas (Lin et al., 2014).

Moreover, the fifth principle links well to the sixth and seventh principles on community and democratising knowledge. Community knowledge aims to produce valuable knowledge for others. While based on democratising knowledge, all participants are legitimate contributors to the shared goals and take pride in the knowledge advancement achieved by the group (Scardamalia & Bereiter, 2010).

The eighth principle is symmetric knowledge advancement, where expertise is distributed within and between communities. The ninth principle is related to pervasive knowledge-building, highlighting knowledge-building as integrating creative work with ideas. These two principles emphasise the joint effort of group members through their participation (Scardamalia & Bereiter, 2010). Lee et al. (2006) state that it is necessary to coach and guide students to execute, observe, and be participative in knowledge-building by minimising reliance on teachers. For instance, a study by Zhang et al. (2009) on three fourth-grade students' understanding of optics using the knowledge-building approach. After this

approach, they found that students' ideas changed from intuitive to more epistemic complexity and scientific ones.

During knowledge-building, students must constructively use authoritative sources of information to be well-versed in a particular discipline. This idea is well tied to the tenth principle of knowledge-building. Ultimately, students must be connected and exposed to the present state and growing edge of knowledge to cultivate their respect for and sound understanding of authoritative sources (Scardamalia & Bereiter, 2010).

Furthermore, the eleventh principle is on knowledge-building discourse. It describes how the learners can generate various ideas in theories, design, conjectures and narratives and develop, refine or explain them through progressive discourse (Lin et al., 2014). Additionally, participants construct, refine, and transform knowledge (Hmelo-Silver & Barrows, 2008). Knowledge-building aims to expand the knowledge and comprehension of the entire community beyond its initial collective knowledge by employing purposeful social interactions. While progressing in collective knowledge, less skilled members can gain from interactions with more skilled ones, and vice versa. This can result in the overall enhancement of the community's knowledge and expertise (Lai & Law, 2006). Hence, this process results in more than just sharing the knowledge among the participants.

Within a knowledge-building community, theories, designs, conjectures, and narratives are ideas that should be expressed and transformed through progressive discourse (Lin et al., 2014). Meanwhile, students posing 'cutting-edge questions' when they engage in knowledge-building discourse can enhance the community's collective understanding. Simultaneously, progressive problem-solving is tackled by pursuing a more meaningful understanding of problems.

Student progress can be observed through their improvement of personal ideas and contribution to collective knowledge advances (van Aalst & Chan, 2007). This progress means that the responsibilities of students are not only to provide their ideas to the knowledge-building community but also to support one another in improving the community's ideas by enhancing them progressively (van Aalst & Chan, 2007). In economics, students can demonstrate progress by improving their ideas and contributing to advancing collective knowledge in various ways, such as research, collaborative work, group discussion, and group work, as demonstrated in this study. These contributions help advance the field of economics by adding new perspectives, insights, and solutions to economic phenomena and challenges.

The last principle is concurrent, embedded, and transformative assessment since assessment is part of the effort to advance knowledge (Scardamalia & Bereiter, 2010). Given that the outcome of a progressive discourse is knowledge, such should correspond to evidence for collaborative problem-solving and work to support others in understanding the shared understanding problems. As such, this initiative can be translated to authentic assessment via collaborative processes in knowledge-building (van Aalst & Chan, 2007).

In their research, Hong et al. (2011) discovered how the knowledge-building environment helps teacher-education students become more engaged in their collaborative efforts to advance knowledge. Their finding is consistent with that of Wells and Arauz (2006). They found that the joint development of understanding between individuals and the group is the most significant benefit of collaborative knowledge-building.

Chan and Chan (2011) explored students' perceptions of collaboration and learning in a computer-supported learning environment. They discovered that students who aligned their collaboration with collaborative knowledge-building tended to adopt a deeper approach

to learning. Farrokhnia et al. (2019) also investigated computer-supported collaborative concept mapping (CSCCM) in physics education. Their study demonstrated that CSCCM significantly improved students' conceptual understanding and promoted knowledge co-construction. This approach leveraged technology and collaborative learning to enhance learning outcomes. Finally, van Aalst and Chan (2007) focused on electronic portfolio assessments using Knowledge Forum™ to support collaborative inquiry. They found that knowledge-building portfolios aided in characterising collaborative knowledge advancement and domain understanding among students.

According to Hong et al. (2011) and Lin et al. (2014), the knowledge-building principles mentioned can be generalised into three entities: ideas as building blocks of knowledge, agents as knowledge workers, and community as a place for sharing and creating knowledge.

The current literature on knowledge-building has been widely conducted in computing, mathematics, science, and medical disciplines (Gilbert & Driscoll, 2002; Gunawardena et al., 1997; Palincsar & Herrenkohl, 2002; Scardamalia, 2002; Scardamalia & Bereiter, 2010; Singh et al., 2007). However, compared with other fields at the tertiary level, there needs to be a detailed knowledge-building investigation in economics. Consequently, educators need help understanding the importance of the applicability of economics that evolves around the recommended knowledge-building principles.

Knowledge-building principles in engineering and computers might be used as economics benchmarks. Engineering and computing have underlying principles and methods that can be modified and used in economics teaching. Firstly, real-world applicability is emphasised in both disciplines while developing knowledge. Similar to this, in economics, principles that emphasise the link between economic ideas and their

application in the real world should be created. Second, engineering and computers frequently entail group problem-solving exercises where students cooperate to resolve challenging problems. Collaborative problem-solving can be used in economics education to motivate students to study economic issues, conduct data-driven analyses, and provide solutions based on economic theories and research. Integrating theoretical knowledge with real-world applications is particularly important in engineering and computers. This idea can be used in economics by encouraging students to relate economic concepts and theories to actual economic phenomena.

These principles emphasise the collaborative nature of knowledge-building, highlighting the significance of group interactions, discourse, and the development of shared understanding. In the context of this study, these principles guide the investigation into how students engage in knowledge-building during group work, how discourse contributes to intellectual progress, how knowledge evolves, and how acquired knowledge can be effectively applied to real-world situations. The twelve principles provide a comprehensive lens through which to analyse and interpret the dynamics of knowledge construction within economics education.

2.5 Learning Outcomes of Group Work

Based on a review of the literature by Mittelmeier et al. (2018), as universities worldwide continue to globalise, higher education classrooms have evolved into unique environments for collaboration among students from diverse nations. Group work is a strategy to foster cooperation among peers with varying backgrounds. This approach has been previously found to enhance the overall student learning experience and provide valuable opportunities for encountering novel ideas and perspectives. Hence, equipping students for the forthcoming professional landscape, which enhances employability, has

become a well-established priority in higher education. Often, this involves imparting students with the skills of effective group collaboration, as highlighted by the research of Sridharan et al. (2019).

Furthermore, each member's efforts are required and indispensable for group success. Moreover, each member contributes uniquely to the joint action based on their resources, role and task responsibilities (Ericksen & Dyer, 2004). For example, each group member could help trigger a chain of ideas (Sirias, 2005).

The functional pattern of interaction is displayed in functional groups. Their functionality is exhibited when group members show enthusiastic motivation and have high self-and group efficacy when they actively achieve group expectations (London & Sessa, 2007). This enthusiastic engagement is often heightened through positive interdependence, a form of social interaction that fosters a shared incentive to mutually support each other's endeavours to attain collective objectives. Positive interdependence creates an environment where the accomplishment of an individual's objective is intertwined with the success of other group members in achieving their respective aims (Davidson et al., 2014). This situation encourages collaboration, resource-sharing, interaction, and conflict resolution, all of which contribute to the overall effectiveness of functional groups in pursuing common goals.

The relationship between social and cognitive aspects of learning is particularly salient in small and collaborative workgroups. This is because students who work with friends in groups are more interested in creating shared spaces and work harder to build joint problem-solving spaces. Moreover, they are more familiar with each other's prior knowledge, communicative strategies and thinking styles (Barron, 2003). Moreover, when group members engage in social interaction, negotiation and consensus-building on the

meaning of newly-emerged concepts are expected. It has been observed that members' contribution to improving their collective knowledge is the primary purpose of knowledge-building (Scardamalia, 2002). This observation signifies that participants construct knowledge through collaborative interactions within a social and environmental context (King et al., 2010; Yew et al., 2011).

Furthermore, group members share responsibility for the overall advancement of knowledge. With research and learning carried out in groups, members can learn how peer learning enforces understanding and how group interaction allows deliberation and the exchange of information (Arvaja, 2005).

Rudsberg et al. (2017) analysed the dynamic interaction between the intrapersonal and interpersonal meaning-making elements based on knowledge content and argument constructed. They discovered that individual experience and sociocultural activity are prerequisites and closely interrelated in meaning-making. One is least likely to understand personal experiences in the meaning-making process without considering sociocultural factors.

Based on the research by McKay and Sridharan (2023), four crucial aspects of collaborative group work emerge. Concerning individual contributions to the task, the capacity to provide peer feedback enabled students to offer constructive evaluations and recommendations to their peers, thereby enriching their experience. Additionally, engagement with team members in the context of positive interactions among fellow team members was observed when there was a sense of synergy and effective communication among students. Such interactions help maintain team cohesion and progress and enable team members to establish expectations for quality outcomes. Students also perceived that

the advantages of collaborative group work encompassed the enhancement of employability, interpersonal, communication, and self-reflective skills.

Moreover, dividing the learning issues results in students becoming experts in certain areas. This scenario encourages collective knowledge construction and significantly improves student problem-solving (Hmelo-Silver, 2004). Furthermore, group members' discussion activates relevant prior knowledge and facilitates new information processing. Hence, students can construct new knowledge more effectively by connecting it to their existing knowledge (Hmelo-Silver, 2004). In addition, feedback that includes suggestions positively impacts students' engagement in learning, fostering deep learning and collaborative knowledge enhancement (Tan & Chen, 2022).

The achievement of learning goals such as team skill development and acquisition of discipline-related knowledge through group work is perceived by most researchers as necessary among students (McCorkle et al., 1999). However, they highlighted that student group work might need to be more effective as a teaching method and unfavourable in terms of its outcomes. This challenge is detailed because the division of work occurs among students before piecing their work together during group projects. As a result, although students have an excellent understanding and knowledge of their particular focused project area, minimal insight into the broader picture is gained (McCorkle et al., 1999).

Two types of learning typically occur in constructing knowledge. First is learning by accretion, where students actively build new understanding by blending their understanding, and second is learning by adjusting existing ideas to align with new concepts (Gunawardena et al., 1997).

Group discussions provide a space for students to construct meaning based on the problem presented to them, and they also allow students to evaluate their understanding of the problem (Hmelo-Silver, 2004; Schmidt et al., 1989). In addition, individuals can develop social interaction skills (Arul, 2007) when they engage socially in talk and activities about shared problems. They try to convince others of the validity of their knowledge claims (Driver et al., 2000).

Li and Campbell (2008) discovered that various thinking perspectives could be improved within a small group discussion. The results of their study exhibited that many participants who are new to group activities expressed that they learnt skills such as problem-solving and conflict resolution and were given opportunities to clarify, challenge, and reflect on their thinking. Due to exposure to group activities, these participants can grasp the theoretical concepts better and adequately complete their assignments as the other students shared many constructive ideas. This exposure means that the provision of group work creates leadership qualities to help drive their tasks, which will be necessary for the workplace.

Groups can learn from various interaction patterns, such as adaptive, generative, and transformative and react to these patterns accordingly as conditions change (London & Sessa, 2007). During adaptive learning, triggers will likely be mild pressures from outside the group that will rapidly result in mental changes in the group process. Readiness to learn is expected to be below, and the group's goal is to maintain itself and its level of performance. Any change in the environment will lead to a group reaction and adaptation with minimal notice or discussion among members.

However, readiness to learn is likely to be high during generative learning. The group forms a collective intelligence that focuses on creating value for the group, and external

pressures and opportunities are likely to be viewed as learning opportunities. This process also includes collecting information, looking for alternatives, reflecting on the work process, testing assumptions, varied opinion-gathering, and adopting new routines (London & Sessa, 2007).

Meanwhile, triggers are likely to be strong during transformative learning, and the readiness to learn is expected to be higher than in generative learning. The goal is to control and build a strong group identity, reframing and transforming members' understanding by integrating divergent perspectives while increasing the group's capacity. When group members critically analyse and modify core values, assumptions, and beliefs based on that critical analysis, transformational learning occurs (London & Sessa, 2007).

Participation in a group requires some experience with group projects and a degree of maturity and commitment, which are only sometimes found among students, mainly in undergraduate courses. If group assessment is employed correctly, it undoubtedly can promote better student interaction and understanding and allow the sharing of different views and knowledge (Strauss & U, 2007). This experience is due to students defining the learning issues and deciding what is relevant to the specific context (Dolmans et al., 2001).

Moreover, with the support of social-motivational factors, students' discussion creates promising opportunities to construct knowledge actively. Their active participation in discourse processes is essential for building individualised meaning (Inagaki et al., 1998). These elements include a positive learning environment, peer collaboration, meaningful work, clear goals, and internal motivation. Students are more likely to actively participate in and gain from knowledge-building when given an environment that encourages and supports their desire to participate in conversations.

Students have greater chances to be involved in observing, reflecting on, and practising socially shared ways of knowing and thinking through student-focused learning activities in a conducive and collaborative working environment. These social contexts allow students to blend common and scientific thinking with their views when approaching learning situations (Kumpulainen & Kaartinen, 2000).

In a mutually interdependent manner, students gain by sharing ideas and accommodating the perspectives of others while providing and receiving assistance. More discussion and elaborated responses are necessary to help members understand other students' views when connecting their ideas and explaining them to others or developing solutions to problems based on the information collected. Group members also require extensive skills to plan, monitor, and evaluate progress in the negotiations of these complex tasks (Blumenfeld et al., 1996). Because the unique feature of human learning is the process of making meaning (Halliday, 1993), building a collaborative relationship is a complicated process (Tartas & Muller Mirza, 2007).

On top of that, practical support for knowledge integration in problem-solving groups is developed in groups to infer new knowledge from interdependent and distributed information (Deiglmayr & Spada, 2010). The interdependence and distribution of information are apparent in complex group tasks. By discovering interdependencies, new interpretations of old information may result, or inferences that lead to further solution-relevant information that no group member could have constructed individually (Deiglmayr & Spada, 2010).

The study conducted by Senior and Howard (2014) on seven first-year students enrolled on a Human Psychology degree at a UK higher education institution suggests that friendship groups produced social contexts. This context facilitated conceptual

understanding through discussion, explanation, and application to real-life contemporary issues. The interaction among members in friendship groups provided contexts for participants to regulate how they learned what they learned and to judge their success as learners; when they had problems understanding concepts from lecture material, their friendships became a resource to help develop their understanding.

The participants generally favoured group work outcomes that exceeded individual results. They believed that groups possessed greater effectiveness than individuals, particularly in tasks involving multiple stages and diverse viewpoints. This was attributed to the groups' ability to swiftly gather and analyse data and harness a broader range of student insights and expertise to address various assessment criteria set by instructors (Xu, 2023).

Nokes-Malach et al. (2015) proposed that intricate problem-solving tasks, such as economic reasoning, derive advantages from exchanging information, varied viewpoints, and acquiring insights can be achieved through group interactions.

Furthermore, Hammar Chiriac (2014) emphasised the role of group work as a means to acquire academic knowledge. In this context, the group and its collaborative process become fundamental for students' knowledge acquisition. Hammar Chiriac's study revealed that the group significantly contributed to knowledge acquisition and fostered learning, ultimately enhancing academic performance. A high percentage (97%) of students acknowledged that working in groups facilitated learning, improved their grasp of academic knowledge, honed their collaborative skills, or achieved a combination of these benefits. They perceived group work as an opportunity to learn more or different things compared to working in isolation. The study identified three prerequisites for practical group work: supporting learning, promoting social interaction, and organising tasks.

Overall, the benefits of group work provide valuable insights into how collaborative learning experiences can support knowledge-building and its practical utilisation among economics students. It explores the role of collaborative learning experiences in enhancing knowledge-building and application among economics students. Also, it offers students the opportunity to engage in active discussions, share diverse perspectives, and collectively solve problems.

2.6 Importance of Collaborative Learning in Group Work

Collaboration can facilitate the process of inquiry. Research has demonstrated that working together can enhance learners' metacognitive abilities, self-regulation, sense of agency, social awareness, dialogic skills, and their ability to navigate situations characterised by uncertainty (Muukkonen & Lakkala, 2009).

The essence of collaboration is the construction of shared meanings for conversations, concepts and experiences (Palincsar & Herrenkohl, 2002). The benefits of collaborative learning include recognising and acknowledging the importance of intellectual contributions made by group members from different social values (Cohen & Lotan, 2014).

Notably, in a collaborative learning environment, learning is conceived as an active process of knowledge construction; students take substantive responsibility for working together. This learning shifts the burden from teachers to respective group members, where minimal support and guidance are obtained from teachers (Arvaja, 2005; Davidson & Major, 2014; Rasku-Puttonen et al., 2002).

Bruffee (1995), on the other hand, states that collaborative learning helps students become autonomous, articulate, socially, and intellectually mature and helps students learn the issues significantly due to a discipline-based inquiry process. Moving forward, in

collaborative learning, students bring their ideas and experiences to learning situations that develop and enhance the understanding of other group members. They construct joint explanations through interaction based on a given case by taking group members' distributed expertise (Davidson & Major, 2014; Hmelo-Silver, 2004).

Johnston et al. (2000) introduced a collaborative problem-solving approach that consists of collaborative learning and problem-based learning in the tutorials of a second-year undergraduate macroeconomics subject. The tutorial sessions were converted into problem-solving sessions where students worked in small groups to confront economic issues that required the application of economic theory. This research found a contradictory finding because students responded positively to the collaborative approach and improved tutorial preparation. Still, unexpectedly, this activity introduction does not seem to increase students' interest in learning economics.

There are certain conditions necessary for promoting collaboration. Firstly, the thinking is distributed among the members of the group. All group members work on the same aspect of the problem simultaneously and share cognitive responsibility for the problem. Next, group members are encouraged to share their thinking as they work together (Palincsar & Herrenkohl, 2002). Kittleson and Southerland (2004), too, indicate that co-construction, the process of jointly building on understanding, is another necessary condition for promoting collaboration. Hence, it is crucial to determine what circumstances allow students to build up their knowledge and apply their expertise in the economic discipline.

A group can play multiple roles, originating from a cognitive perspective. Firstly, expanding existing knowledge allows for alternative problem strategies and inferencing. Another function is related to providing powerful triggers for cognitive dissatisfaction that cause the loci of self-regulatory activity. When learners are exposed to alternative

perspectives, this challenges their initial understanding. Consequently, each learner's knowledge becomes increasingly developed from their advanced peers' contributions while contributing independently to a certain extent. Concerning Vygotsky's Sociocultural Theory, learners work within their capabilities with the scaffold provided by their peers within the ZPD (Glaser, 1991).

Knowledge-building enhances a community's collective understanding by engaging in intentional social interactions. As the community's collective knowledge grows, less knowledgeable individuals can learn from encounters with more knowledgeable individuals. Conversely, more knowledgeable individuals can benefit as the community's general knowledge and expertise increase (Lai & Law, 2006).

Zhang et al. (2009) reviewed previous research comprehensively, identifying three distinct designs for collective cognitive responsibility within knowledge-building communities. These designs encompass the concepts of awareness of contribution, complementary contributions, and distributed engagement. It is worth noting that these designs underscore the dynamic nature of collaborative knowledge-building endeavours and offer insights into how participants collectively contribute and engage in such communities.

Based on research on student learning in collaborative mathematics classrooms in a United States middle school, Webb and Mastergeorge (2003) identified the nature of helping behaviour in small groups. Their findings found that effective help seekers ask detailed questions, persist in asking for help, and apply explanations received. Furthermore, effective help givers provide detailed and elaborate explanations and offer opportunities to help seekers use the descriptions to solve problems and monitor their understanding. The nature of helping behaviours signifies the constructivist views of learning embodied in the Piagetian and Vygotskian perspectives.

When Brindley et al. (2009) reviewed earlier studies, they discovered that in a collaborative learning setting, students actively share and transmit knowledge with one another while working toward shared learning objectives. Learners are active in their knowledge acquisition process as they participate in discussions, conduct research, and exchange information with their peers. The learning process creates a bond between and among learners as their knowledge-building depends on each other's contribution to the discussion.

More importantly, collaborative learning processes assist students in developing higher-order thinking skills and achieving more affluent knowledge generation through shared goals, shared exploration, and a shared process of meaning-making. In addition, students' meaning-making in both subject content and argument formulation can be traced when students construe arguments and react to peers' reasoning when making meaning (Rudsberg et al., 2017).

Developing collaborative skills involves engaging actively, considering others' viewpoints, and monitoring social interactions (Hesse et al., 2015). Nurturing these abilities is crucial for professional success and establishing a diverse and inclusive community (Rowe, 2020). Collaborative tasks emphasise joint effort rather than mere cooperation, requiring all group members to address challenges simultaneously to reach a unified decision (Cagliesi & Ghanei, 2022).

2.7 Authenticity and Practicability of Real-World Problems

Scardamalia and Bereiter (2006) underscore the significance of authenticity in knowledge-building. They emphasise that when knowledge-building efforts fall short, it is

typically due to a failure to address authentic problems and questions that resonate with students and prompt them to contribute genuine ideas.

The problems that students are expected to solve in real-life situations are cross-disciplinary boundaries and demand innovative approaches and problem-solving skills (Duch et al., 2001). This expectation also requires graduates to communicate, negotiate and anticipate what is to be done in practice rather than just doing the job (Iedema & Scheeres, 2003).

Real-world problems motivate students to identify and research relevant concepts and principles that groups must work on. Real-life focuses on the issues and dilemmas posed and is reported to encourage students to learn better, retain new knowledge, and improve the quality of learning (Dolmans et al., 2001).

When learning economics, students work on problems, and they can develop an understanding and gain insights into economic concepts by framing and solving these real-world problems (Mergendoller et al., 2000). Indeed, researchers such as Forsythe (2010), Goodman (2010), and Guest (2012) reported quite similar findings by integrating group work with real-world problems in economics subjects. However, these studies revealed little about the group work process and how members interact and collaborate to advance their knowledge.

On the contrary, problem-solving and critical thinking skills in solving well-structured problems in classroom contexts have limited relevance and transferability to solving ill-structured issues in real-world settings (Jonassen, 1997). Since the problem itself is a real-world problem, complex and ill-structured in nature, it is expected that higher-order thinking, creativity, and synthesis of knowledge can mainly be developed. Learning in real-

world settings is diametrically different from face-to-face or online learning. After all, learning cannot be explained by "any ontology of concepts and rules that supposedly hierarchically describe the world" (Jonassen, 2002, p. 2).

Moreover, self-directed learning in cognitive apprenticeship can be cultivated when students are presented with a real-world problem. This learning process enables students to evaluate and refine their problem-solving strategies (Knowlton, 2003), makes learning abstract concepts more meaningful, and helps them build interconnections with real-world settings (Albanese & Mitchell, 1993). In addition, students prefer opportunities to engage in tasks that give them a sense of ownership in producing knowledge (Åberg et al., 2010).

Meanwhile, Reimann (2004) found that student satisfaction improves when studying economics by applying theories to real-world and current issues in her research. This application allows students to understand the world better and deepen their learning experience. It is essential to note that real-world problems are interdisciplinary in their causes, effects and solutions (Guest, 2012).

Learning to argue goes beyond becoming skilled with a given intellectual technique and applying disciplinary forms of knowledge. This learning is known as accountable knowing, where the emphasis is on responsiveness to others' views. Regarding complex real-world issues, the concept of being accountable also considers responsiveness problems to others' perspectives (Åberg et al., 2010).

Deiglmayr and Spada (2011) discovered that students experienced difficulties integrating interdependent information provided to them. To engage students in integrating independent information, they must be exposed to authentic and complex elements. This kind of exposure that encourages negotiation, problem posing and solving among students

is found in real-world problems. On top of that, this significantly promotes the learner's active problem-posing and explanation-seeking in an open and multifaceted learning situation (Kumpulainen & Kaartinen, 2000). Subsequently, this stimulates students' motivation to learn because they are interested in the topic and enables them to explain their opinions (Haneda & Wells, 2008) to identify gaps in their understanding (Wells, 2002).

Taconis et al. (2016) argue that integrating pertinent real-world contexts into subject matter instruction unifies content, bridges concepts, injects meaning, and creates relevance by aligning with everyday experiences and societal matters relevant to the economy. In their view, a defining characteristic of context-based learning environments is the infusion of practical contexts, endowing significance and direction to the theories and ideas explored within a particular lesson. This suggests that rather than teaching in isolation, education should be framed within the context of the broader world, imbuing students' learning experiences with purpose and applicability.

Integrating learned mathematical concepts, mainly functions, into daily life experiences notably impacts knowledge retention and future learning. In a study by Albayrak et al. (2017), participants were tasked with defining various functions and drawing analogies to everyday situations. This approach aimed to extend the memory duration of acquired mathematical knowledge, demonstrating the potential influence of real-world applications on learning.

Anderson et al. (2020) conducted a study involving 1st-year medical students, focusing on active learning in a clinical context. A team-based learning (TBL) session on familial hypercholesterolemia (FH) incorporated a live patient interaction to convey basic genetics knowledge in a clinically relevant manner. Subsequently, two students applied their learning by presenting a differential diagnosis of homozygous FH during a medical mission

in Central America. This approach effectively nurtured students' clinical reasoning skills, bridging the perceived gap between foundational science and clinical education.

Healy and Walshe (2020) researched the impact of Geographical Information Systems (GIS) training within a two-year A-Level examination course. Their study aimed to investigate how involving real-world industry experts could shape students' perceptions of GIS's relevance to geography and enhance their acquisition of geographical knowledge. The research utilised questionnaires, interviews, and analysis of students' work to assess evolving perceptions, engagement with GIS, and changes in geographical knowledge. The findings suggested that interactions with industry experts facilitated a deeper understanding of GIS and its practical applications, directly contributing to students' geographical knowledge development. This approach highlighted the importance of real-world expertise in educational contexts and its positive influence on students' learning experiences.

Authenticity and practicability in problem-solving tasks can significantly enhance students' learning outcomes. Students who work on real-world problems are more likely to engage deeply with the subject matter and develop a deeper conceptual understanding. By addressing authentic issues in the classroom, students can develop critical skills such as critical thinking, creativity, communication, and collaboration, which are highly valued in the modern workforce. Authentic learning experiences align well with Sociocultural and Social Constructivism Theories. These theories emphasise the importance of social interaction and real-world application in knowledge-building. Authentic problems provide a context for social interaction, collaboration, and applying theoretical knowledge to practical situations. It underscores the significance of providing students with opportunities to use their economics knowledge in authentic, real-world contexts.

2.8 Knowledge-building Through Discourse

Knowledge-building is facilitated within a deliberate learning community dedicated to pushing the boundaries of current knowledge through meaningful discourse (Byker et al., 2017). Byker et al. (2017) emphasise questioning as a fundamental element in constructivist practice and knowledge-building. Scardamalia and Bereiter (2006) argue that initiating the knowledge-building process with a question is the foundation for knowledge-building.

Individuals needing more knowledge tend to generate questions to acquire information. These information-seeking questions can serve as a means to assess the collective understanding within a group, which is essential for establishing shared responsibilities and norms. Moreover, questions play a vital role in fostering effective collaboration by coordinating interactions among group members (King. 1999). By asking task-oriented and monitoring questions, individuals can maintain a practical group discourse and keep the focus on relevant tasks. This approach also supports metacognitive processes, enabling group members to reflect on their thinking and discuss discrepancies. This strategy makes students' thought processes explicit, allowing for exploring differences and negotiation of understanding (King, 1999).

Roscoe and Chi (2007) state that questioning is beneficial when students ask questions that require a combination of new and prior knowledge, reorganisation, restructuring of mental models, derivation of inferences and metacognitive self-monitoring. Furthermore, questions provide a metacognitive cue and act as scaffolding prompts that lead individuals to reflect on their understanding and knowledge before responding and explaining to others. Hence, asking and answering questions could facilitate individuals' engagement in a reflective knowledge-building process.

The findings of Roscoe and Chi (2007) are congruent with those of Webb et al. (2009). Their results exhibited the evolution of questions, problems, debates, and discourse. This evolution helped students perceive things from different perspectives when involved in a deeper inquiry by clarifying ambiguous aspects of their explanations into their probing questions.

Through equally understood communication among students, peer interaction allows them to challenge other students and attempt to resolve contradictions, receive other students' feedback critically, and acknowledge each other's communication and corrections (Webb & Mastergeorge, 2003).

Furthermore, Barron (2003) reviewed the past studies. He synthesised those collaborative intellectual activities among group members through intense face-to-face modes, co-creating designed artefacts, active interaction, and high commitment to work among group members, which could promote intellectual intimacy. There is a high possibility among students to exhibit discourse strategies that promote intellectual practices and lead to productive engagement. Nonetheless, these studies need more details on the specific kinds of discourse that move between participants in a group work context of economics. In contrast, they work with problems by engaging in knowledge-building discourse.

Another type of discourse move is a statement that simply asserts or develops a new view, reformulates, or elaborates on an idea. It also refers to regulatory statements directed to a collaborative learning environment. This discourse requires students to identify knowledge problems and actively improve their ideas. It makes the student's thinking visible and open for discussion (Hmelo-Silver & Barrows, 2008).

Furberg and Arnseth (2009) studied a group of secondary school students who interacted to solve problems in genetics based on collaborative learning activities. They observed that the students' interactional accomplishments changed from problematising to position-driven dialogue. This change is where students used argumentation to explain and justify their views by posing claims and counter-claims to a position-driven dialogue where they constructed persuasive and tricky arguments to win over their group members during their discussion. However, towards the end of the debate, their conversation focused on settling disagreements and solving issues in group assignments. This trajectory of interaction posits that student discussions help address student understanding of discipline-based concepts and help the lecturers understand how students develop their social relationships, identity, and positioning.

Driver et al. (2000) emphasised the significance of constructing arguments when individuals are socially involved in talk and activities about joint problems or tasks. Argumentation is perceived as persuasion or the interactions between individuals in times of effort to convince an audience of the validity of their knowledge claims. With its significant role in triggering critical thinking to learning, argumentation is vital to producing productive, collaborative argumentative discourse, which moves forward, develops knowledge, and creates reasonable solutions to problems (Nussbaum & Edwards, 2011).

Rudsberg et al. (2017) analysed how peers affect individuals' meaning-making about socio-scientific issues in a Swedish upper secondary school. Their findings showed that peers influenced individuals in an argumentative discourse when construing arguments, and they further acted on their peers' reasoning when making meaning. Moreover, most of the additions made by individuals were taken further by their peers to develop arguments in the subsequent discussion. This finding demonstrates the dynamic interplay between

interpersonal and intrapersonal meaning-making in knowledge content and argument construction.

Rojas-Drummond and Mercer (2003) observed that exploratory talk, initially employed in science, law, and business, is a potent means of collective thinking through language. This embodiment is seen as an effective method that holds value within the education discipline, making it crucial for every student to comprehend its significance and be able to utilise it practically.

Mercer (2004) identifies three types of talks in educational contexts: disputation, cumulative, and exploratory. Disputational talk entails disagreement and independent decision-making but needs more constructive engagement. In contrast, cumulative talk involves positive expansion upon peers' ideas, fostering shared knowledge through repetitions, confirmations, and elaborations. On the other hand, exploratory talk engages learners critically and constructively as they exchange ideas and suggestions. This interaction allows for the justification of challenges and counter-challenges, culminating in joint decisions.

Mercer and Howe (2012) further elaborate on the features of exploratory talk and provide an extended version. This version resonates with the effective forms of interaction. Ideally, it is recommended for students to use exploratory talk in group activities as it is considered a valuable kind of ‘co-reasoning’. Speakers adhere to ground rules to aid in knowledge sharing, evidence evaluation, and consideration of options reasonably and equitably. Again, these studies highlight that limited research has been conducted in economic disciplines about the emergence of discourse indicative of students’ participation in knowledge-building.

Knowledge acquired by students based on the proposals and evaluations of arguments during collaboration varies from expertise gained in a typical classroom setting. This acquisition is due to small group discussions supporting students' work on constructing arguments and creating shared knowledge. Students' contributions are repeated and expanded within 'cycles of argumentation' to build and diffuse knowledge. More often than not, changes and revisions are made to the initial construction of the ideas. The ability is adopted and distributed by repeating and reconstructing these ideas through students' argumentation cycles. The students' effort to change and improve these ideas and make them become common knowledge in the classroom indicates their active involvement in this cycle (Elbers & Streefland, 2000).

In meaning-making, students combine their joint efforts to question established knowledge critically. They adopt an open-minded attitude towards new ideas and reach a joint agreement by engaging in discourse (de Jong 2015). From an openness perspective, the discourse activities of knowledge construction and expressing uncertainty are crucial for sustaining knowledge-building discussions. This involves connecting new knowledge assertions to previous ones and inviting others to refine the contributed assertion. To foster collective knowledge-building, community members must intellectually engage with each other in a cognitive process of advancing knowledge assertions. This entails intellectual activities like formulating, comparing, and assessing assertions. It also involves adopting a critical and adaptable epistemic standpoint to assess knowledge assertions and generate alternative perspectives (van Heijst et al., 2019).

Research in Malaysia has focused on teaching and learning the Malay language, particularly in secondary school classrooms. Aman and Mustaffa (2006) applied pedagogic discourse analysis, drawing from Fairclough's Critical Discourse Analysis Framework, to

investigate integrated curriculum classrooms. This approach aimed to uncover hidden social processes, such as teacher dominance in classroom discourse. In the context of Malaysian ESL (English as a second language) classrooms, classroom discourse analysis has been employed to examine verbal feedback provided by primary school teachers. Evaluative feedback, which involves judging learners' performance, emerges as the most prevalent type of feedback. Positive feedback, such as praise, plays a significant role in classroom interactions, as Noor et al. (2010) noted.

Various studies have emphasised the importance of active engagement and collaborative discourse in learning processes in education. Engle and Conant (2002) propose a model called "Facilitating Communities of Learners," which promotes student responsibility for learning through research, sharing, and performing cycles. This model underscores the significance of productive discourse in specific content domains, such as biology.

A 16-week case study investigated 5th-grade students' oral and written argumentation practices using the science writing heuristic approach. Chen et al. (2016) conducted classroom observations, categorising individual verbal contributions into six categories: information-seeking, elaborating, challenging, defending, supporting, and rejecting. Their study found that when students challenged each other’s arguments, they began to concentrate on the coherence and quality of the evidence, and they also used evidence to defend, support, and reject arguments.

Moreover, Hmelo-Silver and Barrows (2008) delved into knowledge-building within problem-based learning groups, specifically examining medical students working with facilitators. Their study revealed that students progressively enhanced their ideas through knowledge-building discourse. Facilitators played a pivotal role by posing open-ended

metacognitive questions and fostering group progress. Students actively contributed to advancing the group's understanding through high-level questioning and building on each other's thoughts.

These studies provide a glimpse into the diverse ways in which students construct knowledge in group work. They highlight methods such as explaining, questioning, debating, integrating perspectives, negotiating meaning, and collectively constructing new understandings through social interaction and collaboration.

2.9 Relationship between Conceptual Change and Knowledge-building

Sociocultural and Social Constructivism Theories are crucial in conceptual change (Scardamalia, 2002). Regarding conceptual change, Boland and Tenkasi (1995) state that collaborative learning is perceived as a dialectic between perspective-making and perspective-taking processes. Firstly, for perspective-making, within a community of knowledge, its vocabulary, methods, theories, values, and accepted logic are refined through language and action. The community needs to overcome the degree of incommensurability by working jointly with each other while maintaining their perspective. Secondly, for perspective-taking, it means that the view is considered.

There are two conditions for change in the perspective of knowledge, both internal and external. Internally, the differences arise from the accumulation of tested and elaborated variances, whereas externally, pressure for change derives from the enthusiasm for a new perspective (Boland & Tenkasi, 1995). Indeed, both perspective-making and perspective-taking processes are strongly linked to assimilation and accommodation discussed under the Social Constructivism Theory.

Davies and Mangan (2007) identify three types of economic conceptual change and provide insights into their progressive nature. The first level, fundamental conceptual change, involves integrating personal experiences with ideas to transform one's understanding of everyday experiences, allowing individuals to connect economic concepts with real-life situations. Moving beyond this, the second level, disciplining conceptual change, emerges when learners acquire a theoretical perspective to integrate and transform their understanding. This level relates to grasping abstract economic concepts rooted in economic theories and frameworks. Lastly, the third level, procedural conceptual change, focuses on constructing discipline-specific narratives and arguments. This advanced level of change is facilitated by acquiring practical skills and methods, which aid in transforming understanding and enable learners to communicate their ideas and create compelling arguments within economics effectively.

The conceptual change process includes modifying and refining students' initial understanding or beliefs to better align with scientific knowledge. Students view ideas as improvable and learn to respect and value them based on their knowledge-building contributions. The proposed ideas are not assumed to be misconceptions, regardless of how naive the ideas are. Instead, all ideas are regarded as valuable and meaningful contributions despite those initial ideas possibly lacking scientific explanations (Lee, 2010).

An essential element called epistemic belief is within the conceptual change and knowledge-building process. Lee (2006) describes the emergence of epistemological belief as an intervening condition in students' conceptual change process. His finding found that students were inclined to engage in self-questioning frequently, provided that they believed that knowledge is changeable, improvable, and can be gained through continuous revision of their understanding. Consequently, students were motivated to develop coherent

knowledge as they could define their learning gaps (Lee, 2010). Developing an individual's thoughts depends on the interaction within a learning community during socialisation.

Li et al. (2010) conducted a study in Australia to explore students' perceptions of group work. They interviewed thirteen Chinese graduate and undergraduate students from two universities in Melbourne. The findings highlighted several positive aspects of group work, including increased engagement, enhanced discussions, better comprehension, and the creation of new knowledge. Students also exhibited positive attitudes towards group tasks. The study identified two types of group work: assignment group work (AGW) and student-generated group work (SGGW). Collaboration was assessed based on three criteria: the level of interaction, knowledge construction, and the presence of shared goals. The research indicated that out-of-class group work in an Australian context was perceived as a valuable learning experience. Students reported improved understanding of academic content, the practical application of knowledge, and the development of social connections with fellow Chinese students.

Chang et al. (2018) investigated learning performance and group work among 246 students enrolled in an introductory biology course for non–science majors at a large public university in the southeastern United States. Group work activities included in-class worksheets designed to structure and organise content knowledge and out-of-class group projects requiring the practical application of acquired knowledge. However, in-depth interviews with students revealed that they did not engage in recognising problems, formulating questions, and constructing explanations.

Students interact with peers and engage in discussions; their existing ideas and concepts may evolve or change. As students' understanding deepens and becomes more aligned with authentic economic concepts, they are better equipped to apply this knowledge

to real-world economic scenarios. This connection between conceptual change and real-world application is essential. The relationship between conceptual change and knowledge-building can be seen through discourse. Students engaging in meaningful discussions and interactions often challenge each other's ideas, leading to conceptual change. These changes in understanding result from the discourse process, which plays a central role in knowledge-building. It highlights how students' understanding evolves during group work, the role of discourse in this process, and how this transformed knowledge is applied to real-world economic challenges. Understanding this relationship will contribute to a more comprehensive picture of knowledge-building in economics education.

2.10 Chapter Summary

This chapter emphasises the significance of economic knowledge and proficiencies, categorising them into basic, disciplining, and conceptual changes. By exploring knowledge-building, the chapter underscores the role of discourse in understanding the dynamics of group work, facilitating the construction of discipline-specific narratives and arguments. The advantages of group work are illuminated, such as fostering employability skills and interpersonal growth. Real-world problems are highlighted as catalysts for contextualised learning, promoting the application of economic concepts to real-world situations. The chapter also reveals how collaborative learning intertwines with knowledge-building, paving the way for transformative conceptual change. Unearthing these dimensions contributes to pedagogical enrichment, aligning with the overarching aim of fostering meaningful knowledge-building and its practical utilisation within economics education at the tertiary level.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Overview

The background of the methodology sets the stage for the research paradigm and design chosen for the study. It provides context by explaining the rationale behind the choice of the qualitative research method, which aims to delve into the complex interplay between students' knowledge-building, collaborative processes, and the application of knowledge. By discussing the alignment between the research aim, the chosen method, and the ontological stance of constructivism, this background elucidates how the methodology is poised to yield insights into the intricate dynamics of knowledge-building and utilisation within economics education. Furthermore, it highlights how the qualitative research method enhances the study's capacity to explore the social interactions and context-dependent aspects of group work that contribute to the overall learning experience and the practical application of acquired knowledge.

3.1.1 Research Paradigm

Under the research paradigm, ontology, epistemology, and methodology are interrelated. The first fundamental question is related to ontology. It concerns “what is the form and nature of reality and, therefore, what is there that can be known about it?” (Guba & Lincoln, 1994, p. 108).

In this study, constructivism is employed as the ontology. Constructivism as a research paradigm aligns seamlessly with the nature of this study, as it posits that learners actively construct knowledge through their interactions with their environment, peers, and

experiences. The focus of this study is to unveil how students collaboratively construct knowledge, negotiate meaning, and apply their insights in real-world economic scenarios. Consequently, constructivism places significant emphasis on social interactions, which resonates with the central focus on group work and the intricate dynamics of shared knowledge creation. However, from the learning theory perspective, constructivism underlies the understanding of how people learn and serves as the foundation for educational practices and strategies (Mann & MacLeod, 2015).

The second fundamental question is related to epistemology. It addresses the question of "how does the knower relate to the realm of knowable?" (Guba & Lincoln, 1994, p. 108). As such, in this research, the epistemological is interpretivism. Interpretivism is chosen as an epistemological stance because this study focuses on understanding and interpreting student experiences and social phenomena in a subjective and context-dependent manner in which the group work is established.

The third fundamental question is related to methodology. It concerns “how can the inquirer go about finding out what can be known?” (Guba & Lincoln, 1994, p. 108). It also outlines how the researcher intends to conduct the study (Butler-Kisber, 2018). Hence, this research methodology is qualitative research. The significant characteristics of this qualitative research have been fulfilled in this research study. Firstly, the qualitative method is naturalistic to the extent that this research took place in real-world settings, and the researcher did not attempt to manipulate the phenomenon of interest. Naturally, the spectacle of interest unfolds in that no predetermined categories are established by and for the researcher, such as in a laboratory (Patton, 2002).

The underlying philosophical ontology for this research fits nicely into the philosophical epistemology, that is, the interpretivism paradigm (Jang, 2007; O'Donoghue,

2007). Constructivism acknowledges the interpretative nature of the findings (Maher et al., 2018) that emphasises social interaction as the base for knowledge (O'Donoghue, 2007). In its historical origins, interpretivism is rooted in 'hermeneutics,' which denotes the act of 'interpreting' or 'comprehending.' According to Crotty (1998), this approach can reveal meanings and purposes that are, in a certain sense, concealed within the text. Consequently, to explore and understand the social meaning of knowledge-building in the context of group work, the researcher must understand how students, who are the participants in group work, construe their social reality where all constructed meanings represent a particular point of view.

The interaction between the students and the researcher involved interviews and observations of face-to-face discussions, focusing on epistemological considerations. In addition to uncovering the participants' experiences in knowledge-building in group work, their behaviour was also interpreted. These interpretations aimed to reveal the subjective meanings underlying participants' actions. These subjective meanings construct knowledge representations from social negotiation within participants' knowledge-building communities (De Vos, 2002; Merriam, 2009; O'Donoghue, 2007).

To profoundly understand participants' actions and social context from their perspective, the researcher maintained prolonged engagement and persistent observation, resulting in richly detailed data for analysis (Geertz, 1973; Merriam, 2009).

Moreover, this qualitative research suits naturalistic inquiry instead of conventional investigations. Qualitative research's focus on context, meanings, and participants' experiences makes it a suitable approach for naturalistic inquiry into group work, knowledge-building, and economics education. According to conventional investigations, there is a single reality to be researched, but for naturalistic inquiry, there are multiple

realities with multiple participant meanings that are socially constructed. These numerous realities cannot be studied in fragmented pieces; however, they are interrelated and influenced by the nature of context (Lincoln & Guba, 1986).

Notably, naturalistic inquiry must adhere to four criteria to improve the trustworthiness and robustness of the data collected. These criteria will be discussed in the section on data trustworthiness.

3.1.2 Research Method

The research method means the general approach of the study (Leedy & Ormrod, 2015). This section explains the rationale for selecting qualitative research for this study. Qualitative research aims to uncover meaning, foster understanding, and explore processes, with outcomes culminating in in-depth descriptions and thematic presentations (Merriam, 2009). According to Rubel and Okech (2017), qualitative research can depict collective behaviours and communication within groups, trace developments over time, explore the various layers of group dynamics, and provide a comprehensive view of contexts and factors.

Hammar Chiriac (2014) employed an inductive qualitative method to understand the experiences and perceptions of university students regarding group work. This method prioritises content and meaning over quantification.

As mentioned earlier, qualitative research's purpose and intended findings align with naturalistic inquiry to elaborate and interpret human phenomena (Bowen, 2008). This intention is based on a complex and holistic picture (Creswell, 1994), where the natural setting is like “laws do not govern the social world in the way that the physical world is thought to be” (Spencer et al., 2003, p. 215).

Despite that, the quantitative research method conveniently allocates utterances to pre-determined categories, measures the relative frequencies of occurrence of particular words, and handles a large amount of data. Quantitative research has limitations to be utilised and employed in natural settings such as this research context. Its constraints are due to the pre-determined categories will limit the researcher's sensitivity to what happens; there is more than one possible functional meaning for utterances; and a fixed coding of types of utterance is not suited to code the dynamic nature of talk as it could not code the meanings that constructed by participants appropriately (Mercer, 2004).

A detailed understanding of the knowledge-building process in group work can be explored, especially if the information is non-numeric and can be analysed using a qualitative research method. Consequently, this allows the researcher to validate findings through observation of the environment. Again, more research is needed on knowledge-building in economics subjects at the tertiary level.

In brief, the qualitative research method is deemed appropriate to address the research objectives and answer the research questions of this study. Hence, this research study focuses on the meaning extracted from the participant's perspective, not the meaning imposed by the researcher nor the meaning expressed in the literature. The two data collection methods, non-participant observations in group discussions and interviews, are more suited to qualitative research.

3.1.3 Research Design

The research design is a guiding structure for data collection and analysis to address a research problem (Leedy & Ormrod, 2015). This study used a qualitative research design (Hammar Chiriac, 2014) in which qualitative data was collected via observations and group and individual interviews. Situated within the interpretative paradigm, qualitative research

prioritises exploration over justification. As such, an exploratory research design fits this context, enabling an in-depth exploration and comprehension of students' knowledge-building experiences in economics group work. The inherent nature of qualitative research aligns harmoniously with this exploratory research design, allowing for the unveiling of fresh insights, patterns, and themes. This process contributes to a more holistic understanding of economics education. On top of that, an exploratory design aims to offer new insights (Malterud et al., 2016) that contribute to the current understanding of an issue that is knowledge-building and knowledge application is well suited for this research context.

Moreover, an exploratory research design skilfully integrates naturalistic inquiry, qualitative research methods, and inductive data analysis. This integration is due to the researcher opting for openness to data emerging as the real scenarios unfold naturally and uncontrollably (Patton, 1990). This research design is mainly adopted in this study to capture the situational dynamics of group work, which sheds light on knowledge-building as an evolving context-bound phenomenon.

The data analysis in observations and interviews describes students' ongoing activities in contemplating real-world problems and represents the socio-cultural context manifested in their group learning practices. In addition, individuals' momentary thoughts, interpretations, and actions are situational and evolve in the interaction between an individual and the social learning context (Järvelä & Salovaara, 2004).

It is necessary to examine group activities in their specific context. Notably, the context does not refer to any predefined or objective environment that typically happens in studies related to causal relationships (Goodwin, 2000). In this study, the participants produce and create their social contexts in their joint activity based on relevant physical,

social and cognitive environments. Due to the limited research on knowledge-building in economics subjects at the tertiary level, the research questions were constructed based on "How" and "What is".

3.2 Sampling Method

Gentles et al. (2015, p. 1775) define sampling as "the selection of specific data sources from which data are collected to address the research objectives." Sampling in qualitative research is more about representing the issues than the representativeness of the population. On this basis, non-probability was the choice of sampling technique in this research study (Maxfield & Babbie, 2001; Onwuegbuzie & Leech, 2007; Palinkas et al., 2015) that deliberately requires sampling with some purpose or focus in mind (Punch, 2014).

An appropriate sample comprises participants who best represent or have knowledge of the research topic (Bowen, 2008). Thus, this study used purposive sampling, as opposed to random sampling, to select information-rich participants in-depth. Merriam (2009) further supports this approach by suggesting that the researcher who wants to discover, understand, and gain insights from a study must select a sample from which the most can be learned.

This study aligns with Patton (2002, p. 230), who says, "Studying information-rich cases yields insights and in-depth understanding rather than empirical generalisation." The essence of qualitative research is to choose individuals who can most effectively assist the researcher in comprehending the issue and addressing the research question (Creswell, 2009).

3.2.1 Selection of the Site of the Study

The higher education institutions in Malaysia are categorised into public and private. Private higher education institutions include private colleges, universities, and university

colleges. They must register with the Ministry of Higher Education Malaysia and are regulated under the Private Higher Educational Institutions Act (Act 555) 1996 (Grapragasem et al., 2014).

Economics subjects are offered mainly by business schools and other higher learning institutions. The business school's dual role mirrors higher learning institutions' dual role in preparing students for future careers through education and generating knowledge through research (Starkey et al., 2004).

Adhering to purposive sampling in selecting the participants, the data collection that involves observation will generally occur in a single research context (Butler-Kisber, 2018). Furthermore, data collection through observation was complemented by interviews. This study investigates a single selection site that focuses on a Business School from a private university in Sarawak. Permission was sought from the university before the data was collected. In March 2016, the study was approved by the university's Human Research Ethics Committee. Video recording was not used in the data collection; it was only voice recording, adhering to the approval of the Committee that permitted the data collection.

The focus of purposive sampling is more on the quality and richness of data than the number of participants (Hennink et al., 2017). Eighty-six participants were involved in this study (see Section 3.24). This research adhered to two principles. Firstly, a selection of samples must be adequate for replication (Morse, 2015), and secondly, the representative must hold information power (Malterud et al., 2016). The purpose is to determine an approximation and adequacy of sample size strongly linked to the sample specificity. The more significant information power the sample holds due to participants having specific characteristics relevant to the study while also demonstrating some variation within the experiences to be explored, the lower number of participants is needed. Adhering to these

principles leads to saturation, which involves accumulating comprehensive data during the research process. It focuses on the breadth and repetition of data collection, thereby enhancing the theoretical aspects of the investigation (Morse, 2015).

3.2.2 Pilot Study

Pilot studies are beneficial in refining research problems and questions, highlighting gaps and issues related to ethics, reliability and sample representation, and encouraging researchers to offer reflexive accounts of their experiences in the data collection process (Sampson, 2004). Mainly, novice researchers, by conducting a pilot study, are better informed and prepared to face the challenges that are likely to arise in the actual field study. Furthermore, the analysis of the results from the pilot study will facilitate the identification of weaknesses and can increase the quality of the research (Malmqvist et al., 2019).

The pilot study was conducted in March 2016, followed by the commencement of the first data collection stage in April 2016. Twelve students, distributed across three groups, actively engaged in the pilot study. These students were enrolled in an undergraduate business course at a private university where the researcher collected the primary data. The pilot study yielded valuable insights and led to the formulation of two key strategies to enhance the data collection process, particularly in observations and interviews.

Firstly, in the pilot study, the researcher only used one voice recorder to record students' group discussions. This technique created issues for the researcher when she transcribed the data, as certain conversation sections were unclear. Due to the problem, the researcher utilised two voice recorders for voice recording in the actual research site.

Secondly, the researcher provided a copy of the interview questions to guide participants during the interviews and facilitate the process. This revision was based on the

feedback from participants in the pilot study, who indicated they preferred to have a copy of the questions.

3.2.3 Selection of Key Informants

To collect in-depth data within the real-life context for this research, the participants were enrolled in economics subjects in undergraduate business courses at a business school. They were in their second and third year of a three-year degree programme. The fieldwork covered three stages from April 2016 to November 2018.

This study focuses on the meaning from the participants' perspective in group work to build up their knowledge. The guideline used in selecting participants followed the guiding principles of Morse (2015) and Robson (2002), where participants must meet this study's designated set of criteria. Firstly, students who enrolled in an economic subject in an undergraduate business course during the data collection stage; and secondly, these selected economics subjects must have a group work component as part of student assessment or project.

The curriculum analysis of economics education at the tertiary level examines the content, structure, and delivery of economics courses offered to university students. It involves assessing the alignment between learning outcomes, instructional strategies, and real-world applications. In this research, economics subjects in Year Two and Three in undergraduate business courses were purposely selected to obtain an accurate picture of knowledge-building through group work. Numerous activities fall under group work, including discussions and problem-based learning exercises. In this study, students collaborated to create a final piece of work that undergoes evaluation, a group assessment.

Nonetheless, both group work and group assessments are authentic practices across various fields, mirroring the demands of future professional settings (Sridharan et al., 2019).

The participants' names and the name of the private university are not disclosed in this study. Participants had no financial incentive, and their participation was solely voluntary. Thus, the controversy raised by Zutlevics (2016), that is, by giving participants incentives to boost participation rates, is negligible in this research.

Since the researcher who conducted this study was not the lecturer for those mentioned economics subjects, it can help minimise potential researcher bias. The researcher also complied with the ethical principles throughout the research study. Before the commencement of the research study, the researcher sought approval from the Human Research Ethics Committee of this private university for ethics clearance and declaration. Upon approval, the researcher identified the economics subjects, including group work assignments. The relevant information regarding these economics subjects, including unit learning outcomes, teaching methods, content, and assessments, is available online. Following the identification of these subjects, the researcher contacted the Dean of the Faculty to communicate her intention to collect data, which was accompanied by the Ethics Committee's approval. Subsequently, the researcher contacted the lecturers for these subjects, who requested that they share information about the study on the online web-based learning system and encouraged student participation.

Before collecting the data, each participant was given a notice of Consent Information Statement to inform them explicitly of the research objectives. The participants indicated agreement to participate in the study by signing off on the consent form (see Appendix B) before it commenced. The researcher assured the participants that the

information provided would be used for the analysis to be published for PhD thesis, conference paper and peer-reviewed journal. Notably, the participants were assured that there was no linkage between their consented participation in this study, the data collected, and their grade performance. Moreover, participants were informed that they could discontinue their participation at any point and could request the removal of their collected data from the study. Lastly, pseudonyms were used to protect participants' names and assure anonymity by adhering to the research ethics.

3.2.4 Number of Participants

To ensure the study's focus, exclusion criteria were established to exclude students enrolled in undergraduate economics subjects without a group work component. On the other hand, the inclusion criteria were designed to encompass students enrolled in economics subject(s) within an undergraduate business course during the data collection phase. The selected economics subjects had to include a group work component in the student assessment or project, providing a targeted framework for the study's exploration.

The initial number of participants was forty-five (45) in 2016, eventually growing to eighty-six (86) through prolonged engagement. This approach is also aligned with the sampling adequacy based on the rationale that “sufficient data to account for all aspects of the phenomenon have been obtained” (Morse et al., 2002, p. 18).

Another guiding principle used to determine the number of participants is based on the recommendation by Corbin and Strauss (2008), which is that a researcher can evaluate themes developed to provide sufficient depth and breadth of understanding of a phenomenon. The linkage of themes is clear, and then it is deemed appropriate to claim that adequate sampling has occurred to meet the study's research objectives.

Data collection took place in three stages. Stage one commenced from April to October 2016. The Dean of the Faculty and the lecturers were contacted about this study. The lecturers posted an announcement on the online web-based learning system to inform students about this study. During this period, twelve groups of forty-five participants were recruited. This recruitment assisted the researcher in formulating a preliminary understanding of the knowledge-building experience of participants in group work.

However, the research was still at the early stage of drawing the findings that met the four criteria of trustworthiness of qualitative research (see Section 3.6). The researcher conducted more interviews and observed more group discussions by recruiting new participants for further data analysis to achieve data and theoretical saturation. In the second data collection stage, from September to October 2017, the researcher recruited four groups of nineteen participants. This recruitment further assisted the researcher in obtaining more data to support the preliminary codes derived from the first data collection and analysis stage.

Lastly, the third data collection stage began from March to November 2018. At this stage, twenty-two participants voluntarily participated in this study. This means that more data have been obtained at the third stage to support the data collection and analysis in the initial two stages, leading to data saturation. The data collection and analysis were concluded at the third stage.

Throughout these three stages of data collection, the researcher recruited twenty-two groups with eighty-six participants. Table 3.1 details the data collection stages and the number of groups and participants in this research study. At the end of the third data collection stage, 45+19+22 = 86 participants constituted the source of the entire dataset for this research study.

Table 3.1: Number of Participants in Three Stages of Data Collection

Data Collection Stage	Month, Year	Number of Groups Recruited	Number of Participants Recruited
One	April – October 2016	12	45
Two	November – December 2017	4	19
Three	March – November 2018	6	22
	Total	22	86

3.2.5 Phases of Study

This research consists of four phases. Phase one is for study preparation, which includes identifying gaps in the literature review, formulating the research aim, identifying the research context, and determining the research methodology. Phase two is to conduct a pilot study. Phase three is for data collection at the research site. The data collection and data analysis coincide. Lastly is phase four, where the thesis writing is prepared.

An extensive literature review was conducted to shed light on the issues surrounding group work, knowledge-building and the underlying perspectives. This review helped the researcher formulate research questions relevant to the research context and avoided queries that could be biased or not meaningful. In economics education, integrating group work encounters complexities in fostering effective student knowledge-building and application. The pedagogical shift towards collaborative learning raises questions about the interplay between individual and collective cognitive processes and the dynamics of collaborative knowledge-building. Balancing individual growth with collective progress in knowledge-building, particularly within economics education, necessitates a nuanced understanding of cognitive, social, and pedagogical factors that influence learning outcomes in group settings.

Draft interview questions were sent to three academicians who were independent reviewers and did not participate in this research. They were requested to comment on the questions' credibility, relevance, and accuracy following the research aim. Based on their feedback, the questions were refined to clarify and align with the research aim (see Appendix C).

3.3 Data Collection Methods

In this study, the data collection through observations and face-to-face interviews was conducted outside the classroom's everyday activities (Mercer & Howe, 2012) to gain insights from the data and answer the research questions (Creswell, 2012).

3.3.1 Observations

Hammersley and Atkinson (1983) state that a researcher can only study the social world if they are part of it. The first data collection method was observation, which involves fieldwork descriptions of activities, conversations, and interpersonal interactions (see Appendix D).

Observations were conducted in group meetings in natural settings arranged by participants in this research study to understand the complexities of knowledge-building. Besides investigating individual and group outcomes due to intermental and intramental processes, the researcher also observed how group members collaborated as a whole group (Inagaki et al., 1998).

The researcher refrained from manipulating the social context of the group discussions. This involved allowing participants to take the lead in determining the meeting agenda and content, with the researcher avoiding the imposition of their agenda, topics, or preferences on the discussions. This approach preserves the authenticity of the social context

and enables genuine interactions and natural knowledge-building processes to unfold. As a result, the insights gained reflect the participants' authentic experiences and perspectives. Furthermore, the researcher assumes an observational role throughout the observations, remaining attentive and taking notes during the group discussion without participating in the conversations.

Observations provide a richer understanding of the participants' contextual environment during group meetings and discussions. These observations also give a thick description (Geertz, 1973) and generate rich information. As group discussions carry on overtime, the monitoring and categorisation of member-to-member verbal expressions provide insights into the group interaction process, which has become the focal point of this research (London & Sessa, 2007).

Ultimately, this method helped the researcher conduct interviews either in groups or individuals. Interview questions were contextualised within the personal experiences of participants, specific critical incidents for discussion, and understanding of participant experience in knowledge-building through group work in terms of their collaborative activities, application of knowledge, and relevant skills in real-world economic problems.

During observations, the researcher kept field notes and recorded everything relevant in as much detail as possible. Jorgensen (1989) states that human memory operates such that the longer one delays recording observations, the more information may fade from conscious awareness. Hence, keeping notes highlights the importance of recording the information to avoid being presented inaccurately.

The observation transcripts were then loaded into ATLAS.ti (version 8) qualitative data analysis software, which was used to code and analyse thematically. The researcher

attended forty-eight observations organised by sixteen (out of twenty-two) groups over two and a half years from 2016 to 2018.

Of the twenty-two groups who participated in this study, sixteen were given consent to be voice recorded during their group discussion. The other six groups needed to provide clearance for the researcher to observe their discussion in face-to-face mode. Regarding clarity of the recording, for transcription purposes, the researcher used two audio recorders based on the outcome of the pilot study. Video recording was not used, only voice recording, adhering to the approval granted by the Human Research Ethics Committee of the university that permitted the research to collect data.

Besides that, the researcher also considered the other challenges of using video records to collect data in a natural setting. For example, how can the researcher systematically decide which elements of a natural environment to study in group discussions? How do we extract data and interpret meaning from video recordings, especially non-verbal communication? (Havnes et al., 2016). In certain circumstances, achieving systematic control over the elements of a natural environment during group discussions can be challenging. For instance, if the group dynamics are highly dynamic and fluid, it may be difficult for the researcher to identify and ascertain specific aspects of the environment relevant to the study. Participants may try their best to interact productively during the group work, which may have been a different level of performance in classroom activities (Hogan et al., 1999). Using the same practice as Anderson and Weninger (2012), the researcher aimed to maintain speech style while reserving intelligibility for a broad audience; in some circumstances, participants communicated with each other in local English and various lexical items such as ‘can’, ‘Aiyoo’, ‘lah’, ‘leh’, ‘loh, ‘ah’, ‘mah, ‘meh’ ranging from surprise, incredulous and query were included in observation transcriptions.

On another note, using the guiding principle recommended by Wells and Arauz (2006), the observation focused on the discourse data to describe how participants engaged in learning and becoming adept at carrying out group inquiries to build up their knowledge in group work.

In some groups, besides communicating in English, their discussion included languages such as Bahasa Malaysia, Bahasa Indonesia, and Mandarin. Among the 86 participants, there were international students. As such, during their group discussion, they communicated in Bahasa Indonesia. The researcher recruited a proficient translator in Bahasa Indonesia to translate and transcribe data to English. The translator was reminded to respect participants' voices because translations are not merely about finding similarities (Chidlow et al., 2014). Other than that, the researcher was the first transcriber for the rest of the transcriptions since she was the observer and interviewer for this research study. As part of the validation process of these transcriptions, 29.2% of the total transcripts were reviewed by two independent coders, and 39.5% of the participants verified the interview transcriptions (see Section 3.6).

To ensure the accuracy of other translated transcriptions, such as Bahasa Malaysia and Mandarin to English, the researcher also sought help from two independent reviewers to verify the transcribed versions. Briefings were conducted for each of them on different occasions by providing a transcription template and study background. Back-translation was not practised in this study because it may establish two words that refer to the same object and may not necessarily convey the intended meaning of the original text (McGorry, 2000). Moreover, back-translation was not employed because participants used local English and various lexical items, such as 'can', 'lah', 'leh', 'loh' and 'ah'. These items, expressing emotions, might only sometimes convey the exact original meaning of the text.

Another example illustrating that back-translation was not practised in transcription number 35: Group 17. In this transcription, a group member, A66, stated, "*Where did I say that firms recruit the workers?*" The phrase "*where did*" is related to the object of recruiting workers; however, within this context, "*where did...*" could carry two meanings. Firstly, it might seek clarification about the specific discussion session where the reference was made. Secondly, it could aim to confirm that she was indeed referred.

3.3.2 Interviews

The second data collection method was interviews, which involved groups and individuals. The interviews aimed to shed light on participants' group work, challenges, support, knowledge-building, and application of knowledge. In this study, face-to-face interviews involved students and groups in eliciting information that could not be derived from observations.

In both group and individual interviews, the researcher started with general questions and then narrowed them down to focused questions in the subsequent interviews (Rubin & Rubin, 2005) (see Appendix E). For example, the general interview questions started with forming a group to evaluate the application of knowledge. Furthermore, a tunnelling format was also adopted, whereby probes supplemented focused questions to encourage elaboration among participants (Corden, 2001).

In addition, the researcher followed Seidman's (2006) recommendation for a three-part interview process.

- The first interview acts as an introduction. When the researcher and participants talk about the study and their backgrounds, they get to know each other to build trust.

- The second interview focuses on the researcher's inquiry into the study. Researchers try to elicit information from participants without leading them and remain flexible to accommodate them while ensuring that the interview stays on track.
- The third interview is when the researcher explores questions that have arisen or have yet to be elaborated fully. The purpose is to check, confirm, or disconfirm with the participants about things emerging in work.

When interviewing, the researcher also established a rapport relationship with participants to encourage them to feel comfortable opening up about their experiences (Wolgemuth et al., 2015). Creating a rapport with participants during interviews is a crucial element of qualitative research; however, it does not equate to the researcher's complete immersion as in observations. In the interview process, the researcher strives to cultivate a relaxed and trustworthy environment that motivates participants to express their thoughts, experiences, and viewpoints freely. This involves ensuring that participants feel respected and appreciated for their contributions.

The focus group interview aims to get collective views on a group of people, typically 3-5 members in a group. The individual students and focus group interviews were organised separately. Direct quotations from interviews are an essential source of raw data in qualitative inquiry. Hence, data consists of verbatim quotations with sufficient context to be interpretable, where the researcher puts together descriptions from separate interviewees and creates portraits of the processes (Rubin & Rubin, 2005). This technique provides participants with opportunities to further elaborate on their experiences. Also, it allows the researcher to collect in-depth data by having students articulate and reflect on their learning experiences (Bauer, 2003). Lastly, the participants' responses were compiled and reviewed for an overview.

To encourage the participants to answer comfortably and honestly, they were informed that anonymity and confidentiality were preserved and that they may withdraw from the study at any time with no consequences on the final grade of their course. The identity of the participants was removed, and pseudonyms were assigned to participants for anonymity when the researcher cited specific direct quotations to support the findings. Also, audio recordings were stored securely, and transcriptions were stored with password protection.

The researcher follows the interview protocol refinement framework (IPR) (Castillo-Montoya, 2016) to fine-tune the interview questions and ensure, to the extent possible, a well-developed instrument to engage in interviews, as presented in Table 3.2 Interview Protocol Refinement Method. With this framework, the researcher was more cognitively prepared to follow intuition and still have a map in her mind of the questions she would ask during the interviews (Castillo-Montoya, 2016). Table 3.2 below explains the IPR framework and how the researcher responds to this framework.

Table 3.2: Interview Protocol Refinement (IPR) Method

Phase	Purpose of Phase	Researcher's Action
1. Ensuring interview questions align with research questions.	To create an interview protocol matrix to map the interview questions against the research questions.	The interview questions are constructed in a sequence starting from general to specific questions based on this research study's objectives. The creation of this matrix serves to identify potential discrepancies in the scope of research questions. Consequently, interview questions are constructed in a sequence that begins with general inquiries and progresses to more specific ones, aligning with the objectives of this research study. For instance, the general questions address the formation process of the group and the initial understanding of the group assignment topic. In contrast, specific questions delve into participants' insights and experiences related to group discussions, research activities, peer interactions, and specific knowledge-building and application incidents.
2. Constructing an inquiry-based conversation.	To construct an interview protocol that balances inquiry with conversation.	The interview questions are constructed in a sequence starting from general to specific questions based on this research study's objectives. Among the 18 questions in the interview protocol, 2 are general questions, while the remaining 16 are specific questions that address the four research questions. This structure ensures that the overall organisation of questions guides the interview protocol towards fostering inquiry-based conversations.

Table 3.2 continued

3. Receiving feedback on interview protocol	To obtain feedback on interview protocol.	Three reviewers reviewed the interview questions before the questions were piloted in March 2016.
4. Piloting the interview protocol	To pilot the interview protocol with a small sample.	Twelve participants from three groups were involved in a pilot study in March 2016.

(Source: Castillo-Montoya, 2016, p. 828)

Selecting the proper recording method for data collection is essential because it provides rich and relatively permanent primary records (Xu & Rajlich, 2005). In this research, the interviews were voice-recorded by two voice recorders. The collated data were transcribed verbatim. Once the transcription was completed, the key points were summarised and confirmed with the participants to ensure the accuracy of the data. Peer review was used to validate the transcripts for validity check by engaging two inter-coders to code the transcripts independently. The details of the inter-coder agreement will be discussed further under Section 3.6, Trustworthiness of data.

On average, each interview session (either group or individual) was approximately thirty minutes to an hour in length. It did not subsequently demand overwhelming time away from the participants' duties as students. This is due to individual or group interviews conducted when participants had free time slots between their classes. All of the interviews were conducted in English.

Each interview was voice recorded, and, following each interview, the responses were transcribed verbatim as Word documents. Similarly to the observation transcripts,

interview transcripts were loaded into ATLAS.ti (version 8) qualitative data analysis software.

The following Figure 3.1 summarises data collection and the phases of data analysis. Step one involved face-to-face observations and interviews. Secondly, step two involved Phase I data analysis. This phase involved the data transcriptions of observation and interview transcripts. As mentioned earlier, the observation and interview transcripts were loaded into ATLAS.ti (version 8) qualitative data analysis software. During the observation, descriptions of activities, conversations, interpersonal interactions, and group dynamics were documented, including how group members collaborate and develop their knowledge comprehension. Subsequently, first-level codes generated using open coding will be performed. The derivation of second-level codes from the first-level codes follows this. The following process is to develop themes based on second-level coding (see Appendix F). Once the final themes are confirmed, narratives will be constructed based on themes.

Thirdly, step 3 involves Phase II data analysis, which will be discussed in Section 3.8. Under this phase, the process of searching for causal relationships between incidents will be identified. This phase will analyse incidents in knowledge-building during group work, progressive discourse, changes and developmental shifts in student knowledge, and application of knowledge to answer the four research objectives.

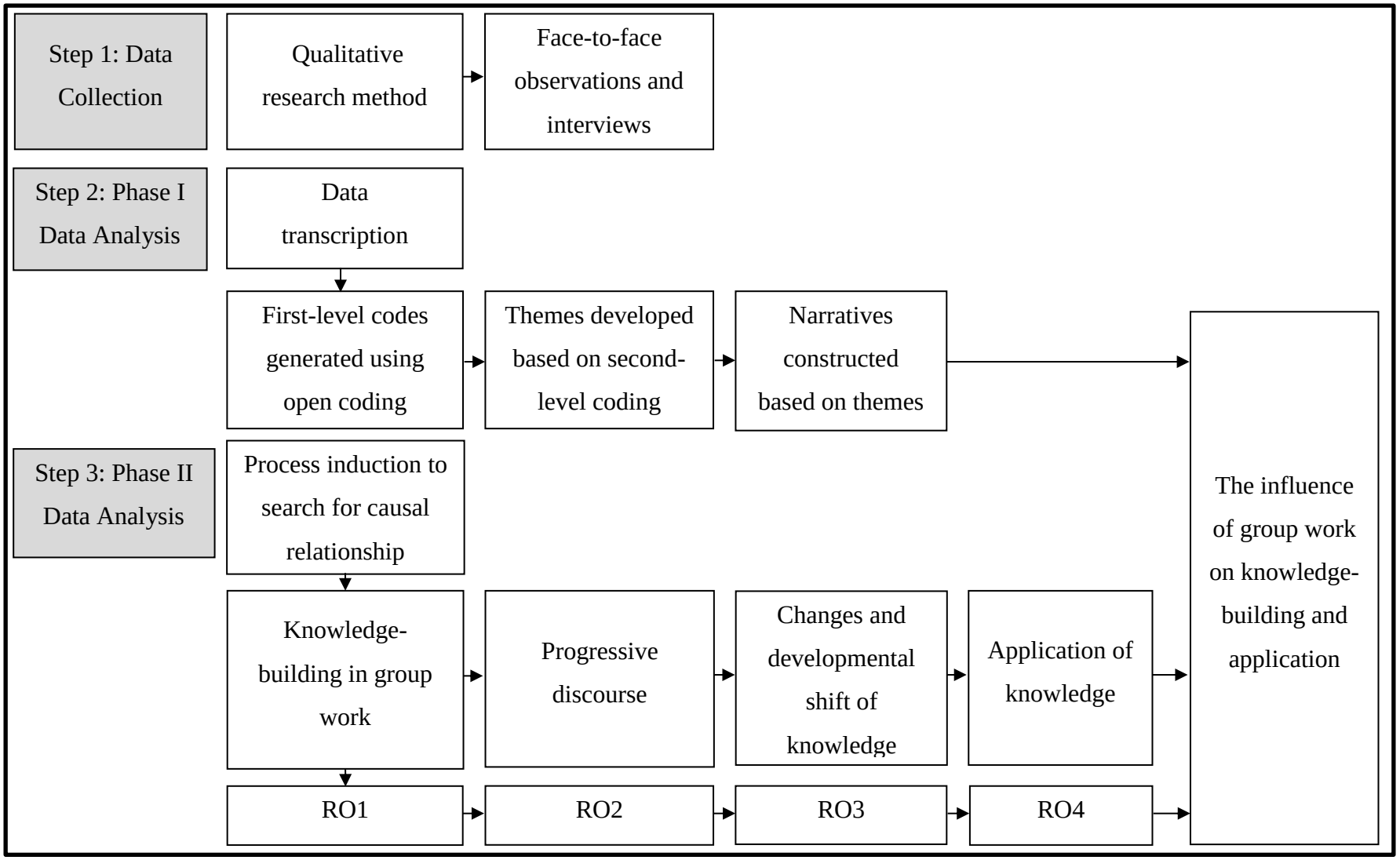


Figure 3.1: Summary of Data Collection and Phases of Data Analysis

3.4 Functions of Memo

In this research, memos were prepared to interpret the data continually throughout the analysis process, as Birks et al. (2008) recommended. These memos were then read, re-read, and analysed to explain the research questions. Writing memos is a flexible process that provides "a space and place for exploration and discovery" (Charmaz, 2006, pp. 81–82). A memo has four functions that can be described using the mnemonic MEMO (Birks et al., 2008).

The first function of a memo is to map research activities. The purpose is to record the decision-making trail that establishes and guides the research through its many phases, from conceptualisation to completion. The memos permit recording the natural progression of research along with any changes in direction and the context from which these arise (Birks et al., 2008). For example, the researcher reflected on what she learned from attending the research colloquium and conference.

The second function of the memo is to extract meaning from the data. This research aimed to explore and understand the knowledge-building experience from the students' perspectives in building their knowledge of economics in group work. As such, the researcher employed analytical strategies such as immersing herself in the collected data, engaging in open coding, and continuously comparing new data with previously coded information as the coding process progressed to enable this meaning to be extracted from the data and subsequently to be able to express it in conceptual terms (Speziale & Carpenter, 2007). No incidental themes are emerging, and the derived themes will be presented in Section 3.10, as they are part of the research focus.

The third function is to maintain momentum. At various stages of this research, the researcher's perspective may be altered as data sensitivity increases. Memos are contemporaneous snapshots of thought processes that help to make the work transparent and can be used to show how and why interpretations evolve (Butler-Kisber, 2018).

The fourth function is to open communication. Memos permit the recording of ideas by enabling comments and input from others who may or may not be involved directly in the research. If required, the researcher kept the memo to convey the ideas to the supervisor and two independent inter-coders.

3.5 Data Triangulation

Robson (2002) emphasises that triangulation of data sources is a standard method within qualitative research to address threats to validity, such as respondent and researcher bias. Significantly, insights gained from data sources can complement and enrich overall research findings (Cohen et al., 2007) and lead to blended and new understandings emerging from data (Lenkauskaitė & Mažeikienė, 2012).

Moreover, Angrosino and Mays de Perez (2000) state that studies based on interviews typically employed observation to verify and validate qualitative analysis (Patton, 2002). The interviews with the participants corroborated and sometimes disconfirmed what was emerging in the data from observations.

Data in the form of quotes from participants' interviews and observation excerpts contribute to the descriptive nature of qualitative research. In this research study, the findings are triangulated through participants' interviews and observation transcriptions, and the results were reviewed simultaneously to identify common and emerging codes.

These two data collections create a multifaceted way of examining knowledge-building through group work. Also, this provides a more comprehensive understanding of the data and increases the findings' persuasiveness. In addition, the results are triangulated by using the guiding principles of trustworthiness in qualitative research (Guba & Lincoln, 1989). Lastly, triangulation across the participants at different stages where participants were involved in observations and participated in group and/or individual interviews has enabled the phenomenon to be better represented, as reflected in the findings.

3.6 Trustworthiness of Data

The validity and reliability of the data were addressed based on trustworthiness (Guba & Lincoln, 1989), that is, through credibility, transferability, dependability and confirmability. The terminologies are adopted in order “to make clear [of] the inappropriateness of the conventional terms when applied to naturalistic and to provide alternatives that stand in a more logical and derivative related to the naturalistic axioms" (Lincoln & Guba, 1985, p. 301). They are equivalent to rigorous criteria in quantitative research of internal validity, external validity, reliability, and objectivity (Morse, 2015). The details of each criterion are explained below.

The first criterion is credibility. This criterion is usually “operationalised” by how well the research represents the phenomenon in a qualitative inquiry. Is the resemblance accurate? Does the description of the essence match the essence of the phenomenon? (Morse, 2015, p. 1213), or in other words, credibility ensures that the study measures what is intended and is a true reflection of the social reality of the participants (Maher et al., 2018). Research becomes credible when carried out and reported sufficiently to show detailed portrayals that resonate with people in other situations (Butler-Kisber, 2018).

The second criterion is transferability. In a qualitative inquiry, the application of the findings to another context or sample is achieved through decontextualisation and abstraction of emerging concepts and theories (Morse, 2015). As such, a thick description (Geertz, 1973) is essential for "someone interested" (Morse, 2015) to transfer the original findings to another context or individuals.

The third criterion is dependability. In a qualitative inquiry, dependability means obtaining the same results if the study were to be repeated (Morse, 2015). It means that the research process is described in detail to facilitate another researcher to repeat the work or look into how the findings will be repeated if the study is replicated.

Lastly, the fourth criterion is confirmability. In a qualitative inquiry, confirmability establishes that data and interpretations of the findings are not figments of the inquirer's imagination but are derived from the data (Tobin & Begley, 2004). Importantly, Guba and Lincoln (1989) emphasise that confirmability is established when credibility, transferability, and dependability are achieved in the research study.

As presented in Table 3.3, the following strategies were adopted and implemented to demonstrate how the research process in terms of prior, during and after data collection has adhered to the trustworthiness guidelines. The researcher used both constructive (during the process) and evaluative (post hoc) procedures to ensure the trustworthiness of the research and provide quality assurance (Bowen. 2008).

Table 3.3: Strategies to Ensure Trustworthiness

Quantitative criteria: Morse (2015)	Qualitative criteria: Guba and Lincoln (1989)	Strategies to ensure trustworthiness
Internal validity	Credibility	• Prolonged engagement in the research site for over two and a half years from 2016 to 2018. • Persistent observation in group discussions for over two and a half years from 2016 to 2018. • Data triangulation is through observation and interview. • Member checking with interview transcriptions were returned to participants to verify. 34 out of 86 participants verified the transcripts (Response rate of 39.5%). Participation in this process is entirely voluntary.
External validity or generalisability	Transferability	• Purposive sampling to collect thick descriptive data. • Research findings that are context-relevant.
Reliability	Dependability	• Data triangulation is through observation and interview. • An audit trial provides documentary evidence of the sequence of research activities. This includes data collection, analysis, interpretation and field notes.

Table 3.3 continued

		• Peer review: Intercoder agreement, 29.2% > 25% of the total transcripts (Campbell et al., 2013) were reviewed by two independent coders who were not involved in this research.
Objectivity	Confirmability	• Data triangulation is through observation and interview. • An audit trial provides documentary evidence of the sequence of research activities. This includes data collection, analysis, interpretation and field notes.

(Source: Guba and Lincoln, 1989; Morse, 2015)

Firstly, the researcher is involved in prolonged engagement, persistent observation, data triangulation and member checking to address the credibility issue, which brings internal validity. Prolonged engagement and persistent observation are necessary to produce thick, rich data and reduce observer effects (Morse, 2015). The researcher collected data over two and a half years from 2016 to 2018 at the research site with repeated interviews and observations until data saturation.

The second strategy is the intercoder agreement. Intercoder reliability measures agreement between multiple coders about coding and applying the themes to the data (Kurasaki, 2000). The comparison of the results of a first coder and a second coder requires the second coder to recode data to see whether that person obtains the same results as the first coder (Morse, 2015) but also signifies a high degree of reliability when coders apply

codes in the same manner (Ryan, 1999). The second coder randomly selects data sections to recode, not the entire data set to double-code (Morse, 2015).

The researcher was the first coder; two coders were involved in the intercoder agreement to establish high intercoder reliability for interview and observation transcripts. The two coders held the relevant academic qualifications and were academic staff in a higher learning institution. The researcher followed the guiding principle of Campbell et al. (2013), selecting 25% of the total transcripts for inter-coder agreement. As presented in Table 3.4 on the intercoder agreement, two inter-coders repeatedly read and re-read 29.2% of total transcripts (percentage of transcription) independently, which is greater than the guiding principle of 25% to verify the first level of codes. The researcher adhered to the approach suggested by Campbell et al. (2013), where 25% of the total transcripts were chosen for inter-coder agreement. This means that the proportion of transcripts selected for intercoder agreement was 29.2%, surpassing the recommended threshold of 25% as proposed by Campbell et al. (2013). Lastly, an inter-coder agreement was achieved, and differences were resolved by discussion between inter-coders and the researcher in the subsequent meetings.

Table 3.4: Intercoder-agreement

Source of data collection	**Number of Transcripts**	**Number of Transcripts Selected for Intercoder Agreement**	**Percentage of Transcripts (%)**
Group Observation	48	16	33.33
Group Interview	38	9	25
Individual Interview	10	3	

Table 3.4 continued

Total	96	28	29.2 is greater than 25% of the guiding principle of Campbell et al. (2013).

Moreover, a member-checking strategy was employed, and the transcriptions were returned to the participants, who agreed to review the transcribed interviews. Participation in this process is entirely voluntary. A meet-up was arranged with the participants based on their availability. This meetup is to avoid misinterpretation during the interview and the transcription process. As a result, thirty-four (out of eighty-six) participants verified the interview transcriptions. This strategy counts for the response rate of verification of 39.5% among the participants. Lastly, the transcriptions for observations and interviews and records for voice recordings are available for audit if required.

3.7 Storage of Data

All data collected was kept confidential, anonymous, and non-identifiable. It was also kept in electronic form and stored on a password-protected computer, and data analysis was also done on a password-protected computer.

3.8 Data Analysis

In qualitative research, the researcher becomes the instrument for analysis when performing data analysis and deciding on coding, theming, decontextualising, and recontextualising the data (Starks & Trinidad, 2007). To ensure the process is credible, the

researcher follows a procedure that aims to meet the trustworthiness criteria outlined by Guba and Lincoln (1989).

Furthermore, in qualitative research, data collection, data analysis, and report writing are separate steps because they are often interrelated and coincide throughout the process (Creswell, 2007).

Moreover, qualitative research is mainly oriented toward exploration, discovery, and inductive logic. The researcher sought to understand better the multiple interrelationships among dimensions that emerge from the data without making prior assumptions by considering individual and group-level perspectives to understand better the dynamic and diverse contexts of knowledge-building in group work. This understanding helps to ensure that emergent codes and discovered-themes are grounded in specific cases and their contexts (Patton, 2002).

To initiate the analytical process, the researcher selected nine (9) transcripts (i.e., D1, D2, D3, D5, D10, D11, D12, D13 and D14) from the observation transcriptions that were collected under the first stage of data collection as the initial set of units of meaning obtained. The grouping of the initial units of meaning was reflected upon and repeatedly read by the researcher in a back-and-forth interplay with the data. First-level codes were assigned to ninety-six transcripts. This process of assigning first-level coders has generated one hundred and fifteen (115) first-level codes, as presented in Table 3.5. These first-level codes provide an initial glimpse into the participants' group work and knowledge-building experience.

Initially, 189 first-level codes (without filtering the overlapped codes) were generated from the data set derived from observation and interviews of groups and individuals. Next, a detailed analysis was performed to find overlapped codes among these

two data collections. It was discovered that the extent of overlapping of these first-level codes reflects the credibility of the findings. This analysis also signifies the reliability of sources of data collection and answers to data triangulation concerns. As presented in Table 3.5, seventy-four (74) of the first-level codes were consolidated in the finalised set. This consolidation is due to these codes emerging in both data collection sources, with eighteen (18) appearing in observations, group interviews, and individual interviews. For example, from the 66 first-level codes extracted from the group interviews, it was found that 18 codes overlapped with those identified in the observation and individual interviews. These 18 new first-level codes were attributed to a single count based on the specific source of observation, avoiding multiple counts. The details of these eighteen codes can be referred to in Table 3.6, and quotations from observation and interviews that support the pertinent codes can be referred to (see Appendix G).

After consolidating the overlapped first-level codes in observation and interviews, the first level of codes generated for these two data collection methods is one hundred and fifteen (115). These emergent first-level codes described the groundedness of cognitive activities, discourse, contextualisation, and self-regulated learning processes. Groundedness means the number of quotations related to a particular code based on documents loaded into ATLAS.ti. This initial analysis gave the researcher a glance and understanding of the phenomenon she was exploring.

Table 3.5: Number of Codes Generated from Data Collection Methods

Source of Data	**Number of transcriptions loaded into ATLAS.ti**	**Number of the first level of codes generated without identifying overlapped codes based on ATLAS.ti**	**Number of overlapped codes**	**The actual number of the first level of codes generated after consolidating the number of overlapped codes**
Observation	48	81 codes	Overlapped codes were not deducted from observation because observation is the first source of data collection.	81
Group interviews	38	66 codes	Eighteen codes overlapped with observation and individual interviews. Fifteen codes overlapped with observation only.	33

Table 3.5 continued

Individual interviews	10	42 codes	Eighteen codes overlapped with observation and group interview.	1
			Twenty-two codes overlapped with group interviews.	
			One code overlapped with observation.	
Total	96	189[++]	74	115

Note[++]: The first code level overlapped with observation, group, and individual interviews.

Table 3.6: Overlapped First-level Codes Emerged in Observation, Group and Individual Interviews

	First-level code	**Total Quotations (Reflected as Groundedness in the ATLAS.ti 8)**
1	Information sharing	336
2	Seeking opinion	190
3	Explaining	175
4	Information searching	140
5	Making inferences on interrelated issues	133
6	Relationship building	113
7	Job distribution	102
8	Providing feedback	89
9	Self-evaluating	89

Table 3.6 continued

10	Shared regulation	86
11	Indicating constraint	74
12	Self-reflecting	69
13	Recollecting	69
14	Self-regulating	68
15	Benefits of the face-to-face meeting	59
16	Making judgement	53
17	Offering help	32
18	Connect the identified issues to real-world	16

Thus, the researcher proceeded with a second-stage emergent coding of the transcripts to understand the essence of group work and knowledge-building experience. This coding of episodic conditions, strategies, interactional, and consequences processes led to twenty-one second-level codes. The derivation of the second level of codes will be presented in Appendix F.

Next, the researcher ‘defined and refined’ the themes by identifying the ‘essence’ of what each theme is about and determining what aspect of the data each theme captures. This process involved clarifying the core concept and significance of each theme within the context of this study. On top of that, the researcher provided substantial evidence of the themes within the data by demonstrating their prevalence.

Finally, the developed common themes would reflect the participants' multiple perspectives on their knowledge-building experience in group work. This phase, which re-focuses the analysis at the broader level of themes, involves sorting the different second-

level codes into potential themes. Essentially, the researcher analysed the second-level codes and decided how these codes might combine to form an overarching theme. After going through a reflective process, the researcher chose to have the first-level code context-dependent to create one of the main themes. Furthermore, seven first-level codes remained in the second-level coding. They are open communication, open-mindedness, co-regulation, shared regulation, self-regulation, problem-solving and peer learning.

3.9 Data Saturation

Data saturation means continually recruiting new participants into a study until the data set is complete (Morse, 2015). No new data is being generated; the data set has reached diminishing returns and begun to repeat. The researcher's furthered action to collect data has become redundant (Bowen, 2008; Hennink et al., 2017).

In this study, saturation was achieved when continually bringing new participants to the study did not lead to any newly emerged first-level codes. This saturation point was attained by Group 22 at its fourth observation (dated 14th November 2018) and its recent group interview (dated 3rd April 2019).

It was found that the third observation of Group 17 (Document ID: D35 or D36, dated 19th April 2018) and the 2nd group interview of Group 17 (Document ID: D32 or D33, dated 4th May 2018) generated little new information to be gained. Figure 3.2 below displays the print screen of ATLAS.ti output for observations. Document ID 35 and 36 denote observation transcripts for Group 17 that loaded to ATLAS.ti. New first-level codes such as ‘brainstorming’, ‘relationship’ and 'thinking’ have emerged in Group 17.

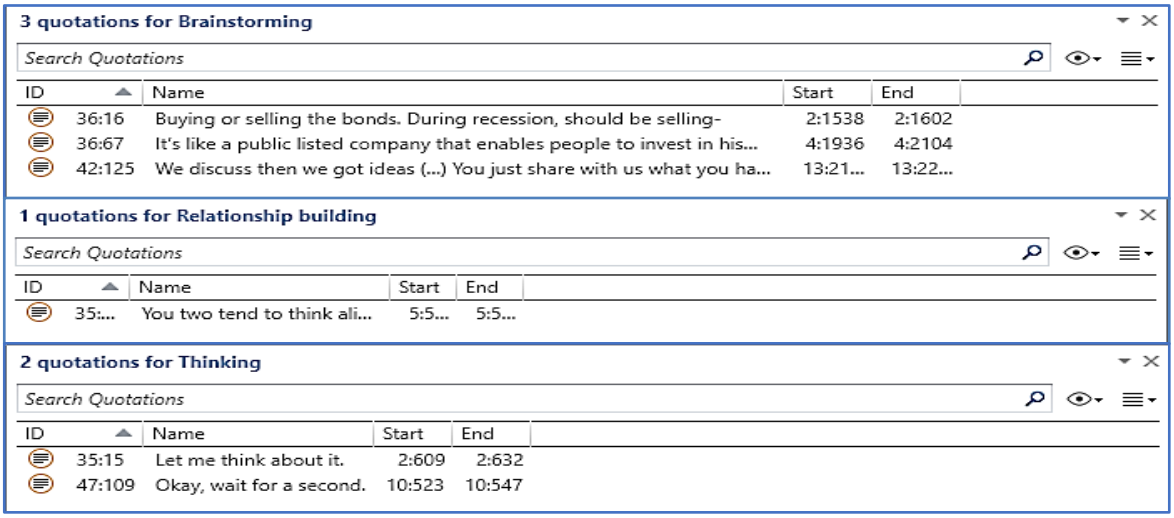


Figure 3.2: First Level Codes for Observation Transcriptions

Meanwhile, Figure 3.3 below displays the print screen of ATLAS.ti output for the group interview. Document ID 32 and 33 denote the group interview transcripts for Group 17 that loaded to ATLAS.ti. It can be seen that new first-level codes such as 'building confidence' and 'encouraging' have emerged at Group 17 as well.

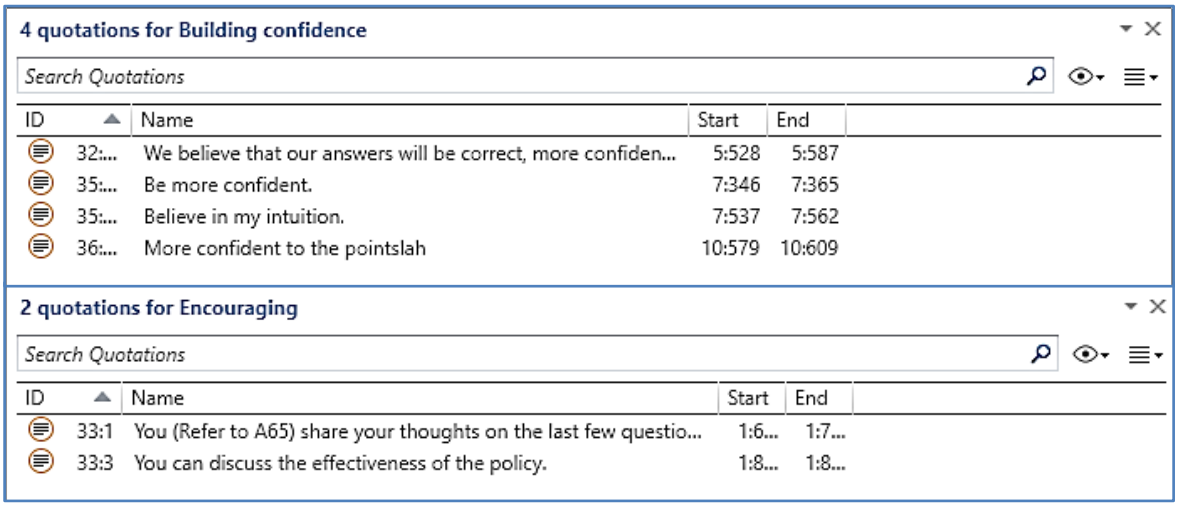


Figure 3.3: First Level Codes for Group Interviews

However, additional observations and interviews were conducted to ensure that the saturation point had indeed been reached. The last observation was conducted on 14th November 2018, and the previous group interview was scheduled for 3rd April 2019 for Group 22. This strategy confirmed the information gained in previous observations and

interviews and demonstrated that the data gathered had reached a point of saturation. As such, the researcher concluded that further observations and interviews were optional and the four research questions could be answered adequately.

3.10 Second-Level Codes and Themes

Table 3.7 below illustrates the derivation of second-level codes based on the first-level codes and how these second-level codes lead to the final themes. The six themes could relate to knowledge-building and application among students who have group work, particularly on economics subjects at the tertiary level. These themes reflect the enabling factors of knowledge-building that stem from observations and interviews that show commonalities among participants involved in knowledge-building and application in group work.

As can be seen from Table 3.7, the first three themes – contextualisation, individual and social responsibility awareness, and collaborative learning are closely related to Research Question One. Meanwhile, intellectual openness is linked to Research Question Two, which focuses on progressive discourse. As for Research Question Three, meaning-making is the theme that suits it, and lastly, the theme that falls under Research Question Four is connectivity. Further discussion on these themes will be presented in Chapter Five, and the details of the derivation of codes, establishment of second-level coding, and final themes can be referred to in Appendix F.

Table 3.7: Generalisation of Themes from Codes

First level codes	Second level codes	Themes	Research Questions
115	Context Ambience Relationship building Autonomy	Contextualisation	One
	Self-regulated learning Co-regulated learning Shared-regulated learning	Individual and social responsibility awareness	One
	Collaborative problem-solving Positive interdependence among members Scaffolding Peer learning	Collaborative learning	One
	Types of progressive discourse Open-communication Open-minded	Intellectual openness	Two
	Identification of knowledge gaps Improvement on understanding Continual improvement on ideas Improvement on knowledge	Meaning-making	Three
	Relevancy of knowledge Application to future prospects Change of perspectives	Connectivity	Four

3.11 Delimitations of the Study

This study was methodically delimited to outline its scope, identifying the boundaries and areas that should have been pursued. Delimitation, as understood in this study following Leedy and Ormrod's definition (2015), refers to the deliberately excluded aspects to maintain focus and feasibility. The study was confined to undergraduate students enrolled in economics subjects within a Business School at a purposely selected private university located in Sarawak, Malaysia. While the chosen university in Sarawak suits the study's research aim by providing valuable insights into the interplay of knowledge construction and application, the findings might not be universally applicable to diverse educational environments. The complexities of university settings necessitate cautious interpretation and restrict the generalisability of these findings to other undergraduate courses offered at distinct institutions (Anderson & Weninger, 2012).

Furthermore, the research was deliberately confined to collecting perspectives from undergraduate business students pursuing economics subjects. The study purposefully excluded viewpoints from other crucial educational stakeholders, including university administrators, faculty members, support staff, industry professionals, and alumni. The concentration on the student perspective narrows the study's focus and scope, providing a deeper insight into their experiences and practices.

While the findings of this study may not be statistically generalisable to a broader context, they still hold substantial significance. First, the study contributes context-specific insights, offering a deeper understanding of particular environments or groups of individuals. These insights can reveal nuances that impact the subject of investigation. Second, despite the limited scope, the findings can be practically helpful within the specific setting studied, guiding decisions and curriculum development. Readers can apply the concept of

'naturalistic generalisation,' utilising the research findings to inform decisions within their settings. Furthermore, the study enables 'analytic generalisation' by contributing, confirming, or expanding theoretical concepts and propositions. This aligns with Yin's (2011) notion of deriving a broader analytical understanding from specific cases.

Nevertheless, this study adhered to ethical guidelines approved by the Human Research Ethics Committee of the aforementioned private university. Additionally, it received approval from the Faculty of Cognitive Sciences and Human Development (FCSHD), Universiti Malaysia Sarawak (UNIMAS) to conduct the study (see Appendix A).

3.12 Chapter Summary

This chapter presents the qualitative research design employed in this study. Data were collected through observations and interviews at a purposefully selected university. Strategies have been implemented to ensure the trustworthiness of qualitative research by addressing credibility, transferability, dependability, and confirmability, along with discussing ethical considerations. Furthermore, it outlines the data analysis process, including the derivation of codes, data saturation, the establishment of second-level coding, and final themes aimed at achieving rigorous findings.

CHAPTER 4

FINDINGS

4.1 Overview

This chapter begins with the findings from the research questions. It explores the processes of knowledge-building, transformation, and practical application among economics students during group work at the tertiary level. By examining the specific strategies employed by students to construct knowledge, discovering their productive discourse, understanding what changes and developmental shifts occur in their knowledge, and assessing the extent and ways in which this knowledge is applied to real-world situations, this study seeks to bridge the gap between theoretical comprehension and practical application in economics education.

4.2 Findings

The following sections present the significant findings and the data sources for the four research questions. Its corroborative evidence supported the conclusions of its data sources and direct quotations. Triangulating the data collected from observations and interviews rendered a holistic understanding of how students built up their knowledge in group work. To triangulate data across the various data collection methods, a code must appear at least once in any observations, group, or individual interviews. In such cases, it will be included and marked with an 'x' to indicate its presence.

4.2.1 Research Question One

Firstly, this study investigates students' processes and strategies in knowledge-building during group work. Based on the data analysis, three significant findings related to

this research question are presented in Table 4.1. These key findings include the significance of context-specific factors in promoting active engagement in group work, individual and collective responsibility in encouraging and motivating participation in group work, and collaborative learning in fostering active participation in group work. Moreover, these findings were supported by triangulation data sources via observation and interviews.

Table 4.1: The Matrices of Findings and Sources of Data Triangulation for Research Question One

Major Findings		**Sources of Data**		
		Observation	**Group Interview**	**Individual Interview**
Research Question 1: How do students build their knowledge when participating in group work?				
The significance of context-specific factors in promoting active engagement in group work.				
1.	Face-to-face meetings in group work ease communication, clarify uncertainties, improve understanding and knowledge on subject matters, and reduce academic procrastination.	x	x	x
2.	The ambience of the group work influences group dynamics.	-	x	x
3.	Rapport relationship tends to develop mutual collaboration in group work.	x	x	x
4.	Empower students to select contemporary economic issues.	-	x	x

Table 4.1 continued

The significance of individual and collective responsibility in promoting and motivating participation in group work.				
5.	Participants self-regulate their learning processes to refine their learning methods and environments.	x	x	x
6.	Participants co-regulate their group members' actions to provide support and guidance for their learning.	x	x	x
7.	Participants jointly share and regulate their collective activities to accomplish a common objective.	x	x	x
The significance of collaborative learning in fostering active participation in group work.				
8.	Group discussions foster collaborative and progressive problem-solving.	-	x	x
9.	There is a positive interdependence in job distribution among group members.	x	x	x
10.	The importance of scaffolding in group work.	x	x	x
11.	The importance of peer learning in group work.	-	x	x

Note[1]: A symbol of '$_X$' denotes data sources retrieved, and Note[2]: A symbol of '-' denotes no data sources retrieved.

As presented in Appendix H, the matrices of findings highlight the importance of context-dependence in group work. The contextual factors impacting group work are intricately tied to participants' perceptions regarding the practicality and usefulness of the chosen meeting platform, the atmosphere within the group work environment, the quality of

rapport among group members, and the degree of autonomy granted to participants in selecting their contemporary economic issues for group projects. As revealed by the study, these factors play a pivotal role in shaping the dynamics and effectiveness of group work, shedding light on the complex interplay between context and collaborative learning outcomes.

In analysing participants' perceptions regarding the practicality and utility of the meeting platform, a striking consensus emerged across the data sources obtained from observations and interviews. Interviewees consistently emphasised their preference for face-to-face interactions, citing its immediacy and dynamism as key advantages. They highlighted that face-to-face group meetings fostered effective communication, dispelled uncertainties, deepened their understanding of subject matter, facilitated information sharing, and acted as a deterrent to academic procrastination, as detailed in Appendix H. In particular, Participant A45 underscored the invaluable role of face-to-face meetings in elucidating complex graphs and enhancing language proficiency for a more profound grasp of economics concepts.

Secondly, participants offered a range of perspectives regarding how the group work ambience influenced group dynamics. They noted that elements such as cheerfulness, democracy, enjoyment, harmony, and comfort had a discernible impact on group dynamics, ultimately enhancing the efficiency of group work and interaction during discussions. Appendix I provides exemplary quotations highlighting these influences. The data in Appendix I reflects a breakdown of fifty-five quotations from nineteen out of twenty-two groups. On average, each group discussed three quotations related to the ambience during their separate group interviews. Additionally, the quotations obtained from individual interviews aligned with those from group interviews, demonstrating consistency in findings between the two.

Thirdly, the rapport among group members emerged as a critical factor influencing the context of group work. This finding was particularly pronounced in the data obtained from group interviews. Participants consistently emphasised the significance of rapport in building strong networks among group members, as illustrated in Table 4.2 through selected quotations from participating groups, including groups 3, 4, 9, 11, and 15. These insights indirectly suggest that face-to-face discussions contribute to developing mutually interdependent relationships and strong bonds among group members.

Table 4.2: Selected Quotations Related to Relationship Building Coded in Group Interviews

Group Number	**Selected Quotations**
Group 3	• We know each other for quite a long time already. • We are more comfortable working with group of friends(lah) that we know so that it is easier for us to communicate and ah (…) exchange information. • Since we know each other, so when we discuss the question so it is very easy so not much trouble like that.
Group 4	• Caring, because we care for each other. • Friendship way.
Group 9	• We know each other, so when we do the group work, a lot easier to talk. • Teamwork because we can choose our team members, relationship is because we get closer (to each other).
Group 11	• Friends, the team, the team is good. • I phobia to team up with people that I don't know because I am the Taurus because Taurus tends to staying around.
Group 15	• Because we are friends and know each other, trust each other, proceed with the parts. • I think I learn a lot of teamwork and meet new friends.

Fourthly, participants critically recognised, during both group and individual interviews, that the autonomy they were granted in selecting contemporary economic issues was instrumental in enabling them to align their chosen topics with their perceived learning outcomes strategically. This insight underscores the participants' active engagement in shaping their learning experiences to achieve learning outcomes.

As presented in Table 4.1, the second key finding, derived from this analysis, highlights a growing recognition among participants regarding the paramount significance of individual and collective responsibility. The comprehensive data gathered from observations and interviews consistently underscored the pivotal role of self-regulation and co-regulation in governing participants' actions and guiding their peers to enhance the learning process. Furthermore, participants emphatically emphasised the co-regulation among group members, aimed at achieving a common objective: timely completion of group assignments.

Analysing the participants' behaviours shows they actively engaged in self-regulated learning practices within their respective group contexts. This included a proactive approach to self-evaluation, self-reflection, and self-motivation. Furthermore, participants exhibited a profound awareness of their responsibilities in ensuring the timely completion of group milestones. Consequently, the tendency toward academic procrastination among participants is notably scarce, a phenomenon well-documented in Appendix H. An intriguing point worth noting is the correlation with one of our sub-findings from research question one, where participants highlighted those face-to-face interactions played a pivotal role in minimising academic procrastination.

Moreover, participants recognised the significance of actively co-regulating the actions of their fellow group members, particularly when they discerned a need to intervene

and provide guidance and support. It is noteworthy that these viewpoints predominantly emerged in specific situational contexts. Participants keenly observed instances where their group members encountered uncertainties or obstacles in their workflow, and in response, they proactively assumed the role of mentors, offering guidance and direction. This phenomenon of co-regulation, which participants adeptly employed, intricately aligns with the third key finding from research question one, which delves into the realm of collaborative learning, explicitly focusing on scaffolding and intersubjectivity, as will be expounded upon in subsequent sections.

For instance, in Group 3, Participant A5, who assumed the role of group leader, strategically employed a co-regulatory approach to guide the team. She acknowledged that her group members needed clarification about the project's requirements. In response, she presented a comprehensive outline for the report and presentation, focusing on the intricate dynamics of the Greek sovereign debt crisis and its repercussions on Europe. Additionally, she addressed the role played by the Greek Government in mitigating the economic turmoil, alongside the government regulator's response.

Participant A5 emphasised the grim state of the Greek economy, primarily attributed to fiscal deficits, which had a detrimental impact on its citizens. Furthermore, she highlighted the government's imposition of high taxation and reductions in retirement funds. Intriguingly, Group members A4, A6, and A7 readily embraced and embarked on the proposed outline for their assignment and report. This strategic approach illustrates the group's commitment to achieving shared objectives while navigating complex subjects (Group 3, First group observation, 8th April 2016).

The significance of shared regulation in group work cannot be overstated. It goes beyond cooperation and fosters a profound commitment, aligning all participants towards a

common objective. This dynamic is vividly illustrated in Appendix J, where shared regulation emerged from various incidents. These incidents encompassed collaborative planning, goal setting, voluntary assumption of additional responsibilities, and the genuine acknowledgement of each group member's contributions.

Furthermore, participants reported experiences where they willingly compromised and displayed heightened receptiveness to their peers' viewpoints. This heightened receptiveness stemmed from their shared commitment to a unified goal. These findings underscore the pivotal role that shared regulation plays in optimising group dynamics and ultimately enhancing the quality of group work outcomes.

Next, the third finding of this research question is the significance of collaborative learning in fostering active participation in group work. Initially, participants astutely discerned that group discussions facilitated collaborative and progressive problem-solving, fostering an environment where complex challenges could be effectively addressed. Subsequently, participants recognised the presence of positive interdependence in allocating tasks among group members. This awareness led to a more equitable distribution of responsibilities, enhancing overall group cohesion. Furthermore, participants keenly grasped the pivotal role of scaffolding within the group work dynamic. They recognised that this supportive framework was critical in scaffolding members' learning processes and nurturing their growth and development. Lastly, participants demonstrated a deep appreciation for the value of peer learning within group work settings. They acknowledged that collaborative learning experiences enriched their understanding and skill development, significantly improving their learning outcomes.

Participants' narrative explanations underscore the critical role of collaborative problem-solving in overcoming shared challenges. As detailed in Appendix K, the insights

shared by participants collectively emphasise the significance of collaborative problem-solving within individual groups and across the broader spectrum of group interactions. Notably, three participants reiterated the importance of collaborative problem-solving during group interviews on multiple occasions, further underlining its central role in their group work experiences.

Concrete evidence of collaborative problem-solving emerged as participants adeptly employed various problem-solving strategies to tackle shared challenges. Among these strategies, the most frequently utilised were the division of labour, proactive help-seeking, and reciprocal assistance within the scaffolding and peer learning processes. The researcher strategically focused on groups 19, 20, and 22 to elucidate the interconnected nature of collaborative problem-solving and these techniques. A thorough analysis of Appendix K reveals that the perspectives and practices of group members in Group 19 reverberated strongly in the experiences of Groups 20 and 22, underscoring the pervasive influence of collaborative problem-solving across these groups.

The context-specific factors motivate students to participate actively in their group work activities. Individual and collective responsibility are key drivers in motivating and promoting participation in group work. Moreover, students recognise the importance of taking responsibility for their learning and contributing to the group's success. Apart from that, collaborative learning is an essential aspect of fostering active participation in group work. It enhances engagement and participation as students work together to achieve common goals and share knowledge and ideas.

4.2.2 Research Question Two

The second research question examined the productive discourse in the economics domain that contributes to intellectual progress. Based on the data analysis, three findings were related to this research question as presented in Table 4.3, which includes matrices of findings and sources of data triangulation. These significant findings include productive discourse that emerged in knowledge-building, open communication, and receptivity to various ideas and perspectives exhibited.

Table 4.3: The Matrices of Findings and Sources of Data Triangulation for Research Question Two

Major Findings		**Sources of Data**		
		Observation	**Group Interview**	**Individual Interview**
Research Question 2: What are the productive discourses contributing to intellectual progress in economics?				
Finding 1: Types of productive discourse emerged in knowledge-building in group work.				
1.	The most commonly used productive discourse includes explaining, expressing views, agreeing, asking questions, emphasising, and encouraging.	x	x	x
Finding 2: Open communication is a vital element of progressive discourse.				
2.	Within the open communication process of knowledge-building, various forms of discourse have emerged, including arguing, defending, denying, disagreeing, and even being sarcastic.	x	x	x

Table 4.3 continued

Finding 3: Receptive to a variety of ideas and perspectives contributes to the progression of discourse in knowledge-building.				
3.	Participants demonstrated receptiveness to various ideas and perspectives, reflecting their open-minded approach in the group work.	-	x	x
4.	Participants exhibited an increased readiness to learn by implementing effective learning strategies, showcasing their commitment to open-minded learning in group settings.	x	x	x
5.	Participants showed an enhanced commitment to fostering diversity and inclusion within group work, underlining their open-mindedness toward different perspectives and backgrounds.	x	x	x

Note[1]: A symbol of 'x' denotes data sources retrieved, and Note[2]: A symbol of '-' denotes no data sources retrieved.

The first significant finding is related to the types of progressive discourse that emerged throughout the knowledge-building in group work. It was discovered that the most commonly used productive discourse includes explaining, expressing views, agreeing, asking questions, emphasising, and encouraging, which contribute to intellectual progress in economics. Among these, explaining, expressing views and agreeing are the top three discourses that yield more extraordinary quotations. Although the number of quotations linking to 'explaining' is less than expressing a view and agreeing, it was used commonly in the knowledge-building discourse among the participants, whereby this discourse was

observed being practised by participants in their respective discussions and acknowledged by participants in both group and individual interviews as presented in Table 4.4.

Table 4.4: Sum of Groundedness of Codes for Progressive Discourse

Progressive discourse	**Number of quotations**			**A total number of quotations is coded based on ATLAS.ti Code Document Report**
	Observation	**Group Interview**	**Individual Interview**	
Explaining	156	13	6	175
Expressing view	366	12	-	378
Agreeing	237	1	-	238
Asking questions	128	-	1	129
Emphasising	103	3	-	106
Encouraging	23	2	-	25
Informing	327	-	-	327
Repeating	36	-	-	36
Introducing presentation outline	18	-	-	18
Defining the issue	11	-	-	11
Initiating idea	7	-	-	7
Evaluating	4	-	-	4
Brainstorming	3	-	-	3

For instance, this example vividly illustrates the group's dynamic nature of knowledge-building. It showcases how a member actively engaged with and responded to another member's explanation, highlighting the collaborative and interactive nature of the

group's learning process. In a specific instance within Group 5, during a face-to-face meeting on the 6th May 2016, Participant A16 took the initiative to explain the meaning of 'Al-Waldiah' in the context of Islamic banking in response to an inquiry from Participant A15. This exchange was observed during the group's session. Subsequently, in the group interview that immediately followed this observation, Participant A15 expressed how he could integrate the principle of 'Al-Waldiah' with Islamic banking in his home country, Kenya. This interaction underscores the practical and applicative nature of the group's discussions, where members actively contribute to each other's understanding and potentially influence their future actions.

Moreover, participants explicitly highlighted the utilisation of other progressive discourse, including expressing viewpoints, reaching consensus, posing inquiries, emphasising key points, and fostering collaboration. It becomes apparent that these discourses should be considered integral components of knowledge-building discourses, underscored by their significant contributions to the process.

For instance, within Group 4, Participant A13 boldly asserted that Greece could not repay its debts, a perspective that resonated with Participant A11. The latter concurred, contending that Greece had been utilising its loans primarily for debt servicing rather than fostering economic transformation. In their comprehensive discourse surrounding the Greek economic crisis, Participants like A11, A12, A13, and A14 interchangeably employed terms such as 'bailout,' 'riot,' 'bankrupt,' 'escape,' and 'corruption' to elucidate the complex economic predicament Greece faced. Participants A11 and A14 acknowledged that their understanding of Greece's economic intricacies remained relatively superficial. Participant A11 succinctly captured this, stating, "*The thing is we only know [sic] a bit a bit … Can't connect these pieces of information together*" (Group 4's observation, 28th April 2016).

Subsequently, Participant A11 further expounded in her interview that group discussions offered a platform for members to articulate their viewpoints, fostering collective learning and mutual understanding (Group 4, Participant A11, Individual interview, 20th May 2016).

Table 4.4 shows that among the various discourses identified, informing, repeating, introducing presentation outline, defining the issue, initiating the idea, evaluating, and brainstorming did not surface prominently in the interview data. Strikingly, these discourses seemed to be confined to the observation phase alone. This observation raises intriguing questions about the emphasis placed by participants on certain discourses. This preference for specific discourses warrants deeper exploration, as it hints at the potential influence of discourse choice on the knowledge-building process.

Moreover, Table 4.3 shows open communication, a vital element of progressive discourse, is actively practiced in knowledge-building within group work. Within the open communication process of knowledge-building in group work, various forms of discourse have emerged, including arguing, defending, denying, disagreeing, and even being sarcastic.

However, upon closer examination and comparison of these discourses, intriguing findings indicate that the participants' selection of discourses evolved as a dynamic process. As the discussions evolved, participants transitioned from mere expression to active defence of their views. They skilfully constructed and exchanged ideas, leveraging their exposure to diverse perspectives and concepts. To illustrate this dynamic nature, an examination of an extract from face-to-face discussions focused on the contentious debate surrounding issues related to the Goods and Services Tax (GST) is presented.

In the initial face-to-face meeting, Group 1 discussed Malaysia's GST rate (Group observation, 8th April 2016). During a subsequent meeting, Participant A1 vigorously

contested that Malaysia's GST rate was excessively high. She defended her arguments by comparing with other countries, such as Singapore, Thailand, and New Zealand, where GST rates were notably lower (Group observation, 20th April 2016). However, Participant A3 opposed, vehemently rejecting A1's proposal to lower the Malaysian GST rate. A3 justified her position by emphasising the necessity of GST revenue for long-term economic growth, particularly for developing essential public infrastructures like hospitals and schools. Participant A2 echoed A3's perspective (Group observation, 20th April 2016).

Subsequently, during the follow-up focus group interview, Participant A3 emphasised the democratic nature of their group discussion, where members could express their opinions freely regarding the debate on Malaysia's recommended GST rate (Group 1, Group interview, 12th May 2016). This finding underscores the depth of Group 1's deliberations regarding whether to maintain or reduce the GST rate in Malaysia. Their approach can be aptly characterised as a form of inquiry, marked by their continuous exploration of various potential solutions to the questions at hand. Participants' speculative assertions serve as pivotal points, inviting further engagement from other members, thereby sustaining the discourse. Consequently, within this dynamic inquiry process, participants bring forth diverse facets of the issue, effectively illuminating the precise challenges and complexities that demand resolution to address the situation.

Within the open communication process of knowledge-building in group work, many emotions and feelings, including annoyance, excitement, frustration, surprise, worries, confusion, curiosity, doubts, and uncertainty, have emerged. For instance, participants in these group settings openly voiced their emotional states, encompassing annoyance, excitement, frustration, surprise, worry, confusion, curiosity, and uncertainty. This unreserved expression signifies the participants' emotional transparency and underscores

their comfort within the group work environment. In order to check for the validity of the subjective analysis, peer review was employed to validate the transcripts for validity by involving two inter-coders who independently coded the transcripts. Scripts containing codes indicating emotions were included among the selected scripts for inter-coder agreement.

To illustrate, in the context of Group 5, Participant A15 proposed an unstructured presentation format for comparing conventional and Islamic banking and exploring the advantages, disadvantages, and opportunity costs of Islamic banking. However, this suggestion was met with resistance from Participant A16, who articulated apprehension regarding delivering an unstructured presentation, thus highlighting the dynamics of open communication within the group (Group observation, 6th May 2016).

Furthermore, additional discourses related to open communication are detailed in Appendix L, accompanied by illustrative quotations from participating groups. For example, in Group 1, team members engaged in open communication, arguing, denying, and expressing their annoyance; in Group 17, team members defended their positions and expressed confusion; and in Group 21, team members expressed surprise, excitement, and curiosity.

Participants demonstrated receptiveness to various ideas and perspectives, reflecting their open-minded approach in the group work. Also, they exhibited an increased readiness to learn by implementing effective learning strategies, showcasing their commitment to open-minded learning in group settings. This openness was particularly striking in Groups 1 and 7, where members demonstrated open-mindedness by embracing various ideas and perspectives on pressing contemporary economic issues, such as the imposition of GST in Malaysia and the dynamics of free trade between Malaysia and China. Furthermore, they

showed an enhanced commitment to fostering diversity and inclusion within group work, underlining their open-mindedness toward different perspectives and backgrounds.

This phenomenon was notably observed in specific groups, such as Group 1, during their discussions on the implications of GST on personal lifestyles and in Group 7 while deliberating on matters concerning the free-trade agreement between Malaysia and China. To underscore this finding, we can examine two illustrative incidents extracted from these groups, outlined in Appendix M, shedding light on instances of cognitive dissonance. In Group 1, the observed cognitive dissonance revolved around group members harbouring divergent viewpoints concerning implementing GST and its effects on personal lifestyles. Conversely, in Group 7, Participants A26 and A24 exhibited conflicting perspectives regarding free trade.

Despite differing perspectives among group members regarding the implementation of GST, it is noteworthy that participants collectively reported an enhancement in their understanding of the issues during their group interviews. This observation resonates with Sociocultural and Social Constructivism Theories, which emphasise the importance of social interactions and discourse in building knowledge. According to these theories, learning is a social process through engagement with others and exposure to diverse viewpoints. In this context, the participants' acknowledgement of improved understanding suggests that engaging in open dialogue and considering diverse viewpoints may have facilitated knowledge construction and a more profound comprehension of the complex issues surrounding GST implementation. This finding underscores the potential of Sociocultural and Social Constructivism Theories to explain the cognitive benefits of open communication and exchanging ideas within a group work setting.

Participants in the study employed a range of progressive discourses, including explaining, expressing views, agreeing, asking questions, emphasising, and encouraging. These strategies served as the foundation for knowledge-building within their groups. One notable aspect was the dynamic nature of discourse selection. Participants only adhered to a single discourse but adapted their communication as discussions progressed. This adaptability highlights the flexibility and responsiveness within group discussions. The analysis revealed that participants often engaged in inquiry and speculation, particularly when discussing complex or contentious topics. They speculated on different options and tested various viewpoints, contributing to an exploratory and constructive approach to problem-solving.

Cognitive dissonance occasionally emerged when participants encountered differing perspectives. However, instead of hindering progress, these instances often led to deeper exploration of the issues. Participants were willing to entertain diverse viewpoints and the discomfort that sometimes accompanies this process. They consistently highlighted the importance of open communication in their group work. This ambience allowed them to freely express their feelings, uncertainties, and diverse perspectives, contributing to a democratic and inclusive group dynamic. The findings align with Sociocultural and Social Constructivism theories, emphasising the role of social interaction, discourse, and exposure to diverse viewpoints in knowledge-building. Participants' acknowledgement of improved understanding suggests that engaging in open dialogue facilitated knowledge-building and more profound comprehension of complex issues.

4.2.3 Research Question Three

This study was designed to analyse the critical changes and developmental shifts in student knowledge within group work. Based on the data analysis, four significant findings

related to this research question, as presented in Table 4.5, include improvements in the ability to analyse prior and/or current knowledge gaps, enhanced comprehension, continual refinement of ideas, and advancement in knowledge regarding contemporary economic issues.

Table 4.5: The Matrices of Findings and Sources of Data Triangulation for Research Question Three

Major Findings		**Sources of Data**		
		Observation	**Group Interviews**	**Individual Interviews**
Research Question 3: What changes and developmental shifts occur in student knowledge within group work?				
1.	Improvements in the ability to analyse prior and/or current knowledge gaps.	x	x	x
2.	Enhanced comprehension of contemporary economic issues.	-	x	x
3.	Continual refinement of ideas regarding contemporary economic issues.	x	x	-
4.	Advancement in knowledge regarding contemporary economic issues.	x	x	x

Note[1]: A symbol of '$_{X}$' denotes data sources retrieved, and Note[2]: A symbol of '-' denotes no data sources retrieved.

In the context of the first finding, it becomes evident that participants embarked on a gradual journey of self-assessment, effectively scrutinising their existing and evolving knowledge. Consequently, they performed self-evaluations, recognising that their comprehension had experienced substantial growth, thereby contributing significantly to their overall learning advancement. This observation stems from a thorough analysis of

group interview excerpts from various data sources. These excerpts reveal that participants skilfully harnessed their pre-existing economic knowledge to construct mental frameworks addressing intricate economic challenges, including money laundering, the global financial crisis, and the Great Recession.

In Appendix N, the evidence presented herein materialised during observations and was consistently cited by participants during group and individual interviews. It is especially notable within Groups 6, 10, and 20 that prior knowledge emerged as a fundamental catalyst for fostering unique knowledge-building processes and, consequently, driving enhanced learning outcomes. These participants adeptly leveraged their existing knowledge as a foundational framework for identifying their knowledge gaps, gauging the necessary effort, and nurturing their inherent desire for knowledge acquisition. In a striking illustration of this phenomenon, Participant A19 in Group 6 delineated her transformative journey from the colloquial vernacular, represented by 'dirty money,' to the more academically precise terminology of 'money laundering.' This progression eloquently exemplifies her relentless pursuit of a deeper understanding of complex economic issues. Based on the observations and interviews, the synthesis revealed that prior knowledge was key in Groups 6, 10, and 20, driving unique knowledge-building and enhanced learning. Participants leveraged existing knowledge to identify gaps and foster a desire for learning.

Within the insightful narratives provided by participants in Group 6, it became evident that they grappled with an elusive understanding of the intricate nuances surrounding money laundering, its alarming ramifications, and the intricate web of factors influencing changes in the Gross Domestic Product (GDP). For example, Participant A22 in Group 6 said, “But through this project, I found that it [*money laundering*] will not only affect the country’s economy but maybe will affect the income distribution and also even reduce the

annual GDP of the country, but will also affect like the interest rate, exchange rate around the world, bring much impact of the economic aspects" (see Appendix N).

Similarly, in Group 10, participants candidly acknowledged the limitations of their knowledge of collateralised debt obligations (CDOs) and the root causes underpinning the global financial crisis (GFC). Moreover, the accounts shared by Group 20 participants underscored their realisation that certain facets of the Great Recession, the intricacies of imprudent lending practices, and the mechanics of monetary policy remained unclear in their comprehension. This illuminating finding underscores the proactive nature of our participants, who astutely engaged in self-reflection upon their existing knowledge landscapes. Recognising the lacunae within their comprehension, they strategically charted a course of action to bridge these knowledge gaps. Such endeavours were undertaken with a genuine commitment to preventing any hindrance to the progression of their group work.

Furthermore, based on extracts from group interviews, several participants offered explanations regarding strategies for improving their understanding and knowledge. They identified that this improvement could be attributed to techniques such as distributed expertise and workload, involvement in research (including information searching through evidence-based sources), authentic assessment, utilisation of discourse strategies, peer learning, and scaffolding. Interestingly, participants showed a greater willingness to shift or revise their ideas when discussions and feedback were evidence-based; consequently, they extensively searched for information throughout this group work process.

In general, the participants consistently applied similar strategies across groups. As detailed in Appendix N, these strategies are considered effective in addressing the participants' knowledge gaps and contributing to improving their understanding and knowledge.

The third finding relates to continually refining ideas about contemporary economic issues. This was especially evident in observations, where participants collaborated to enhance and build upon each other's ideas, improving their understanding and knowledge of contemporary economic issues.

Tables 4.6 and 4.7 provide insightful excerpts highlighting ideas' ongoing evolution within group discussions. In Group 17, Participant A66 initiated a discussion by probing her group members about the potential shifts in the LM curve caused by imprudent lending activities. However, A67's response did not offer a clear-cut answer; instead, she introduced her perspective on the ease of lending with imprudent activities. This led to A67 posing a question to A66, asking if the curve shifted outward (Turn 25). This inquiry sparked A66's critical thinking, prompting her to respond, "*LM is one curve, this is IS. Because the borrowers can obtain a lot of loans, so this boosts up investment*" (Turns 26). A66 even visualised the combined effects of imprudent lending activities, suggesting a shift in the IS curve to the right. These instances exemplify the dynamic process of idea refinement within group work, emphasising its role in enhancing participants' comprehension of contemporary economic issues.

Table 4.6: Excerpt One Illustrates the Analysis of the Continual Refinement of Ideas

Turns	**Person**	**Third observation: 19th April, 2018**
20	A66	Because of imprudent lending activities, which direction will the LM curve shift?
21	A67	Let me think about it.
22	A66	Imprudent lending activities will cause-
23	A67	(overlapping) It's easier for lending out money.
24	A66	So which direction will it shift?
25	A67	Doesn't it shift outward?

Table 4.6 continued

26	A66	LM (Liquidity-money) curve is one curve, this is IS (Investment–saving). Because the borrowers can obtain a lot of loans, so this boosts up investment.
27	A67	Correct!
28	A66	So, the IS curve shifts to right.

Note: All the data were transcribed verbatim.

Furthermore, as presented in Table 4.7 in Group 21, A81 complemented the GDP and price level ideas after A82 was explained to him. Lastly, A81 could draw the relationship between GDP and inflation by saying, "*GDP and inflation level are positively related*."

Table 4.7: Excerpt Two Illustrates the Analysis of the Continual Refinement of Ideas

Turns	**Person**	**Second Observation: 3rd November, 2018**
39	A81	A80, if GDP increases, will inflation drop?
40	A82	Once there is an economic growth, inflation surely increases.
41	A81	What is inflation?
42	A82	Price level increases.
43	A81	How about GDP?
44	A82	GDP should increase. How to say? The concept is like this.
45	A81	Like this? How about price level? Price will increase as well?
46	A82	Price follows the inflation level. Inflation increases, price level also increases.
47	A81	GDP and inflation level are positively related.

Note: All the data were transcribed verbatim.

Based on Tables 4.6 and 4.7, it was observed that both Participants A66 and A81 referred to their group members' responses as scaffolding prompts to guide their cognitive

processing due to ambiguous aspects of their understanding. At the end of the discussion, they filled in gaps in their knowledge and even elaborated by drawing the relationship between the economic variables.

The fourth finding is the advancement in knowledge of contemporary economic issues. As detailed in Appendix O, participants critically evaluated their knowledge levels and acknowledged their progress. Most attributed their knowledge enhancement to rigorous information searching, reliance on evidence-based data, collaborative peer learning, effective scaffolding, dynamic group discussions, distributed expertise utilisation, and active group work engagement. A comparative analysis between Appendix N and Appendix O reveals a persistent trend in the strategies employed by participants to advance their comprehension and knowledge within the group work context. For example, Appendix N shows Participant A37 employed peer learning to improve his understanding. This same strategy was also adopted in Appendix O for further improvement. Additionally, as shown in Appendices N and O, Participant A38 actively searched for evidence-based information for his research.

Upon examining the data (as presented in Appendix O), it becomes evident that participants emphasised the importance of information searching, mainly focusing on evidence-based sources. This emphasis underscores the role of self-regulated learning, a theme previously explored in-depth under Research Question One. Participants undertook proactive research initiatives driven by the absence of academic staff involvement in their group work endeavours. Consequently, they actively embraced and assumed responsibility for co-regulated and shared-regulated learning processes in this collaborative knowledge-building endeavour.

As illustrated in Table 4.5, an in-depth analysis revealed striking commonalities in the participants' evolving comprehension, ideas, and knowledge. Their journey through group work was characterised by a dynamic interplay between individual and social learning, a phenomenon that significantly impacted their evolving perspectives. As participants navigated their group discussions, they demonstrated a remarkable capacity for adaptability in their knowledge constructs. They exhibited a growing inclination to critically assess their existing knowledge critically, strategically employing self-improvement tactics and solidifying their affirmations as they grappled with contemporary issues, as meticulously documented in Appendix O. What emerged was a collective enrichment of their shared knowledge, indicating that, over time, participants achieved a heightened ability to construct their understanding of real-world issues, exemplified by their reference to "*more knowledge on what is happening outside*."

However, it is noteworthy that a minority of participants voiced apprehensions regarding their grasp of economics and its relevance. For instance, Participant A70 candidly remarked, "*Not much change in the understanding at this moment. Because I am poor in economics, this is due to, I don't have much knowledge on economics*" (Group interview, 3rd April 2018). Similarly, Participant A62 expressed a somewhat detached perspective, stating, ' "*Economy is not the major part of my life, maybe it is helpful for me*" (Group interview, 2nd March 2018). These observations shed light on the nuanced spectrum of participants' engagement with economics within the group work context.

Participants exhibited a multifaceted progression in their engagement with contemporary economic issues throughout their group work. They first demonstrated improvements in their capacity to scrutinise existing knowledge gaps, indicating a growing self-awareness of their learning journey. Subsequently, their comprehension of

contemporary economic issues deepened, underscored by continually refining their ideas within the group context. This dynamic interplay between individual and collective knowledge-building ultimately led to an advancement in their understanding of these pressing economic matters. This synthesis illuminates the iterative nature of knowledge development within the collaborative group work setting, where participants evolved from knowledge gap analysis to enriched comprehension and ultimately to an elevated level of expertise.

4.2.4 Research Question Four

This study examined how students can critically apply the knowledge acquired through group work to real-world applications. Three findings related to this research question, as presented in Table 4.8, are enhanced proficiency in relating knowledge to contemporary economic issues, improved capability to link contemporary economic issues with prospects, and participants repositioning themselves on economic, social and political issues. These three findings are remarkable results as there was a discernible gap in knowledge-building and its applications.

Table 4.8: The Matrices of Findings and Sources of Data Triangulation for Research Question Four

Major findings	**Source of Data**		
	Observation	**Group Interview**	**Individual Interview**
Research Question 4: To what extent and in what ways do economics students at the tertiary level apply the knowledge acquired through group work to real-world applications?			

Table 4.8 continued

1.	Enhanced proficiency in relating knowledge to contemporary economic issues.	x	x	x
2.	Improved capability to link contemporary economic issues with prospects.	-	x	x
3.	Participants reposition themselves on economic, social and political issues.	-	x	x

Note[1]: A symbol of 'x' denotes data sources retrieved, and Note[2]: A symbol of '-' denotes no data sources retrieved.

Appendix P provides a comprehensive view of how participants have enhanced their proficiency in relating knowledge to contemporary economic issues. They demonstrated deliberate efforts and explicitly articulated how they intricately linked their knowledge to these pertinent issues.

To further solidify these findings and create connections between the research questions, the researcher selected two pivotal groups, namely Groups 6 and 10, building upon the insights from Appendix N. This selection investigated whether participants could effectively translate their enhanced understanding, ideas, or knowledge into practical applications. Within this context, notable participants such as A19 and A22 in Group 6 impressively illustrated their proficiency in associating money laundering with complex topics such as terrorism financing, globalisation concerns, and various macroeconomic factors. Similarly, Participant A37 in Group 10 showcased her aptitude in critically evaluating the ripple effects of the US global financial crisis on the international stage. This synthesis underscores the participants' remarkable capacity to bridge the gap between theoretical knowledge and real-world economic challenges.

Moreover, it is noteworthy to highlight the exceptional performances of participants from Groups 4, 8, and 19. These individuals exhibited a remarkable tendency to comprehend Greece's debt crisis and extend their analyses to encompass broader macroeconomic variables and their implications on the global stage. Their insights transcended mere academic assignments; instead, they delved into the practical application of their knowledge to tackle contemporary economic challenges.

For instance, participants astutely connected Greece's debt crisis with a spectrum of macroeconomic factors and phenomena such as the global economic landscape, Sovereign Wealth Funds (SWF) within the macroeconomic environment, alternative investment opportunities within stock markets, and the intricate chain reactions reverberating throughout supply chain industries in times of recession.

The observations gleaned from Appendix P unequivocally demonstrate participants' capacity to identify causal relationships and draw meaningful inferences regarding the interconnectedness of these macroeconomic variables. This shift underscores their evolving ability to navigate contemporary economic issues' complex terrain with precision and nuance.

The second finding is the enhanced capability to link contemporary economic issues with prospects. The participants predicted their ability to apply their knowledge to prospects. They projected they could link the contemporary economics issues they worked on with prospects under various circumstances. This application means that at this point, participants perceived that their improvement in understanding, ideas or knowledge through the knowledge-building process in this group work enabled them to expand their current perspectives to a broader scope by incorporating the time factor. During the interviews, participants deliberately shared their more comprehensive views on contemporary economic

issues by laying down a deeper relationship with prospects with considerable high levels of cognitive activity.

Refer to Appendix Q, which provides a collection of excerpts exemplifying instances where participants skilfully intertwined their acquired knowledge with prospects. These prospects span the spectrum from macroeconomic to microeconomic considerations, offering a comprehensive view of participants' forward-thinking abilities. Participants artfully connected various topics within these examples, encompassing housing bubbles, the business cycle, macroeconomic variables, potential market growth, decentralised digital currencies, sovereign wealth funds, and unemployment challenges. In doing so, they projected the ramifications of these economic facets on various aspects, including wealth inequality, future career trajectories, investment landscapes, the evolving trends in decentralised digital currencies, the amplifying impact of sovereign wealth funds, and forthcoming employment opportunities.

Participants' forecasts regarding prospects were firmly rooted in their progress, as identified in Research Question Three. They demonstrated the capacity to take on new insights, enabling them to broaden their perspective by establishing meaningful connections between contemporary economic challenges and potential future outcomes.

The third finding for Research Question Four was how the participants repositioned themselves on economic, social and political issues. They demonstrated a notable adaptability in economic, social, and political matters. This process of repositioning was observed to unfold as participants engaged in the group work dynamics. They actively contributed to discourse, identified knowledge gaps, engaged in introspection for self-improvement, employed collaborative problem-solving strategies, received valuable scaffolding from their peers, and were immersed in authentic, contemporary economic

issues. This multifaceted approach fostered a deeper understanding and enriched their repertoire of ideas and knowledge.

The process of how the participants exhibited a propensity to adapt their positions in this context signifies a profound shift in participants' perspectives. It necessitated a comprehensive examination and reflective analysis of their existing viewpoints, an active embrace of multiple perspectives, and a sophisticated integration of these novel viewpoints with their existing ones. This intricate process involved a nuanced form of perspective-making and taking cultivated within the dynamic knowledge-building community.

As presented in Appendix R, participants deliberately revealed their knowledge-building experience and shared how their perspectives on economics, politics, and society were changed substantially. For example, Participants A1 and A78 commented on how the new perspectives gained from contemporary issues on GST and the housing bubble market in the United States created their sense of awareness. They recognised the significant impacts of these issues on their lifestyle, particularly their consumption trend. Consequently, with the gain of these new perspectives, they reflected on the best option to take. Participant A1, for instance, decided to be competent in utilising her budget to avoid paying the unnecessary GST. In contrast, Participant A78 realised that a boom in the housing market might cause the market to collapse.

Next, moving on to issues of ethics and politics, Participant A43 underscored the paramount importance of upholding ethical principles in her future career, particularly after gaining a profound understanding of the workings of money laundering in practice. In stark contrast, Participant A51's awareness was directed towards her role and responsibilities as a citizen within her country. She recognised the imperative of exercising her right to vote in elections, thus actively engaging in the democratic process. Furthermore, she astutely

commented on the prevailing trend among today's teenagers, who increasingly favour online social platforms over traditional newspapers as their primary news source.

On a different note, it is worth noting that Participants like A8 and A64 underwent a transformative experience that led them to appreciate the intricate web of connections between macroeconomic variables. In contrast, Participants A58 and A61 reevaluated their perspectives, particularly in behavioural economics, where they explored the intersections of learning interests in economics and honed analytical skills for dissecting economic data.

A fundamental conclusion that emerges from these findings is the ongoing cognitive engagement of participants throughout the knowledge-building process. Participants exhibited a relentless commitment to critical thinking and reflection, diligently deciphering the practicality of their evolving understanding, ideas, and knowledge.

Participants showed notable transformation in their knowledge utilisation capabilities during the knowledge-building process. This transformation encompassed an enhanced proficiency in connecting existing knowledge with contemporary economic issues, a growing capacity to discern the implications of these issues on prospects, and a propensity to dynamically adapt their perspectives on economic, social, and political matters. This multifaceted evolution underscores the dynamic nature of knowledge-building within group work contexts.

4.3 Summaries of the Findings

Table 4.9 presents the summaries of the findings for Research Question One. The summaries include context-dependence in group work, preference for face-to-face interactions, influence of group work ambience, importance of rapport among members,

autonomy in topic selection, shared regulation in group work, compromise and receptiveness in group work, collaborative learning, and scaffolding and peer learning.

Table 4.9: The Summaries of Findings for Research Question One

Research Question One: How do students build their knowledge when participating in group work?
1. Context-dependence in group work: Contextual factors such as the practicality and usefulness of the meeting platform, group work environment, quality of rapport among members, and autonomy in selecting topics significantly impact group work. 2. Preference for face-to-face interactions: Participants preferred face-to-face meetings for their immediacy and dynamism, which fostered effective communication, reduced uncertainties, deepened understanding, facilitated information sharing, and deterred procrastination. 3. Influence of group work ambience: The atmosphere, characterised by cheerfulness, democracy, enjoyment, harmony, and comfort, positively influenced group dynamics and efficiency during discussions. 4. Importance of rapport among members: Strong rapport among group members was crucial for building effective networks and enhancing the group work context. 5. Autonomy in topic selection: Autonomy in selecting contemporary economic issues allowed participants to align their topics with their learning outcomes, promoting active engagement in their learning experiences.

Table 4.9 continued

6. Individual and collective responsibility: There was a strong emphasis on individual and collective responsibility, with self-regulation and co-regulation playing pivotal roles in guiding actions and enhancing the learning process.
7. Shared regulation in group work: Shared regulation fostered commitment and alignment towards common goals, involving collaborative planning, goal setting, taking on additional responsibilities, and acknowledging each member's contributions.
8. Compromise and receptiveness: Participants willingly compromised and were receptive to peers' viewpoints, driven by a shared commitment to a unified goal, which optimised group dynamics and improved group work outcomes.
9. Collaborative learning: Group discussions facilitated collaborative problem-solving and active participation, addressing complex challenges and fostering positive interdependence through task allocation.
10. Scaffolding and peer learning: The supportive framework of scaffolding was critical in nurturing members' learning processes. Participants employed strategies like division of labour, proactive help-seeking, and reciprocal assistance to tackle shared challenges effectively.

Next, the summaries of findings for Research Question Two are presented in Table 4.10. The summaries focus on types of progress discourse, integral components of knowledge-building discourse, less prominent discourses, open communication, transition to active defence, emotions in open communication, receptiveness and open-mindedness, the foundation for knowledge-building, and cognitive dissonance.

Table 4.10: The Summaries of Findings for Research Question Two

Research Question Two: What are the productive discourses contributing to intellectual progress in economics?
1. Types of progressive discourse: The most commonly used productive discourses in group work are explaining, expressing views, agreeing, asking questions, emphasising, and encouraging. Explaining, expressing views, and agreeing are the top three discourses yielding extraordinary quotations. 2. Integral components of knowledge-building discourse: Expressing viewpoints, reaching consensus, posing inquiries, emphasising key points, and fostering collaboration are integral to the knowledge-building process. 3. Less prominent discourses: Informing, repeating, introducing presentation outlines, defining issues, initiating ideas, evaluating, and brainstorming were not prominently featured in the interview data. 4. Open communication: Open communication is vital in group work, encompassing discourses such as arguing, defending, denying, disagreeing, and sarcasm. 5. Transition to active defence: Participants moved from merely expressing views to actively defending them, constructing and exchanging ideas using diverse perspectives. 6. Emotions in open communication: Emotions and feelings like annoyance, excitement, frustration, surprise, worries, confusion, curiosity, doubts, and uncertainty emerged during the open communication process. 7. Receptiveness and open-mindedness: Participants were receptive to various ideas and perspectives, reflecting an open-minded approach and an increased readiness to learn through effective learning strategies.

Table 4.10 continued

8. Foundation for knowledge-building: Explaining, expressing views, agreeing, asking questions, emphasising, and encouraging formed the foundation for knowledge-building within groups. 9. Cognitive dissonance: Encountering differing perspectives occasionally led to cognitive dissonance, but this often resulted in deeper exploration of issues and a willingness to entertain diverse viewpoints despite the discomfort.

Table 4.11 presents the summaries of findings for Research Question Three. The summaries include self-assessment and knowledge growth, utilising pre-existing knowledge, identifying knowledge gaps, strategic self-reflection, improvement strategies, collaborative idea refinement, critical knowledge evaluation, and the dynamic interplay of learning.

Table 4.11: The Summaries of Findings for Research Question Three

Research Question Three: What changes and developmental shifts occur in student knowledge within group work?
1. Self-assessment and knowledge growth: Participants engaged in self-assessment, recognising substantial growth in their comprehension, which significantly contributed to their overall learning advancement. 2. Utilising pre-existing knowledge: Participants skilfully used their pre-existing economic knowledge to construct mental frameworks for addressing complex economic challenges.

Table 4.11 continued

3. Identifying knowledge gaps: Leveraging existing knowledge as a foundation, participants identified knowledge gaps, gauged necessary effort, and nurtured their desire for knowledge acquisition.
4. Strategic self-reflection: Participants engaged in proactive self-reflection, recognising gaps in their comprehension and strategically planning actions to bridge these gaps, ensuring smooth progression in group work.
5. Improvement strategies: Participants identified various strategies for improving understanding and knowledge, including distributed expertise, involvement in research, authentic assessment, discourse strategies, peer learning, and scaffolding.
6. Collaborative idea refinement: Participants collaborated to refine and build upon each other's ideas about contemporary economic issues, enhancing their understanding and knowledge.
7. Critical knowledge evaluation: Participants critically evaluated their knowledge levels and acknowledged their progress in understanding contemporary economic issues.
8. Dynamic interplay of learning: An in-depth analysis revealed commonalities in participants' evolving comprehension, ideas, and knowledge, characterised by a dynamic interplay between individual and social learning, significantly impacting their perspectives.

Moving on, Table 4.12 presents the findings for Research Question Four. The findings focus on the practical application of knowledge, tackling contemporary economic

challenges, identifying causal relationships, linking issues to prospects, broadening perspectives, adaptability to economic, social, and political issues, and commitment to critical thinking.

Table 4.12: The Summaries of Findings for Research Question Four

Research Question Four: To what extent and in what ways do economics students apply the knowledge acquired through group work to real-world applications?
1. Practical application of knowledge: Participants effectively translated their enhanced understanding and knowledge into practical applications, bridging the gap between theoretical knowledge and real-world economic challenges. 2. Tackling contemporary economic challenges: Insights gained by participants went beyond academic assignments, allowing them to apply their knowledge to address contemporary economic issues. 3. Identifying causal relationships: Participants demonstrated the ability to identify causal relationships and draw meaningful inferences about the interconnectedness of macroeconomic variables, showcasing their evolving capability to navigate complex economic issues. 4. Linking issues to prospects: Participants linked contemporary economic issues with prospects, predicting their ability to apply this knowledge in various future scenarios. 5. Broadening perspectives: New insights enabled participants to broaden their perspectives, establishing meaningful connections between current economic challenges and potential future outcomes.

Table 4.12 continued

6. Adaptability on economic, social, and political issues: Participants showed notable adaptability in economic, social, and political matters, repositioning themselves as they engaged in group work dynamics. 7. Commitment to critical thinking: Throughout the knowledge-building process, participants exhibited relentless cognitive engagement, critical thinking, and reflection, ensuring the practicality of their evolving understanding and knowledge.

4.4 Chapter Summary

The triangulated findings are presented as a combination of data collected through observations and interviews, addressing the four research questions. These findings emphasise the significance of context-specific factors, individual and collective responsibility, and collaborative learning in promoting active engagement and motivating participation in group work. The study outlines the types of productive discourse, showcases open communication, and the receptivity to various ideas and perspectives that contribute to intellectual progress in group work. In terms of changes and developmental shifts in student knowledge, improvements are observed in students' ability to analyse prior and current knowledge gaps, enhance comprehension, continually refine ideas, and advance their understanding of contemporary economic issues. Lastly, regarding how students apply their knowledge to real-world applications, students demonstrated enhanced proficiency in relating knowledge to contemporary economic issues, improved capability to link these issues with prospects, and their ability to reposition themselves on matters related to economics, society, and politics.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Overview

Several critical factors have emerged as catalysts for active student engagement in group work. Context-specific elements play a pivotal role in motivating and fostering participation, underscoring the significance of tailoring group work to the unique circumstances of the learning environment. Moreover, individual and collective responsibility stand out as fundamental drivers, compelling students to take charge of their learning while contributing to the group's success. Collaborative learning creates a synergy where students work harmoniously, pooling knowledge and ideas to achieve shared goals.

Within the discourse of group work, participants employ a repertoire of productive strategies such as explanation, expression of views, agreement, questioning, emphasis, and encouragement. These strategies collectively propel intellectual advancement within the group, contributing to a richer understanding of economic concepts. The critical element of open communication thrives within this discourse, fostering knowledge sharing and building. Participants exhibit an openness to diverse ideas and perspectives, encouraging constructive dialogue. Their ability to scrutinise existing knowledge gaps enhances their analytical prowess, leading to a more profound comprehension of contemporary economic issues.

5.2 Discussion

The following sections present the discussion of the findings of the four research questions.

5.2.1 Research Question One

Concerning the first research question, three themes relate to how students build up their knowledge in group work. These significant findings include the significance of context-specific factors in promoting active engagement in group work, individual and collective responsibility in encouraging and motivating participation in group work, and collaborative learning in fostering active participation in group work, as reported in Chapter Four.

5.2.1.1 Contextualisation

A recurring and pivotal theme from the findings underscores the imperative of contextualisation within group work. This theme strongly resonates with the perspective advanced by Taconis et al. (2016), which emphasises that incorporating relevant real-world contexts into subject matter instruction is indispensable for consolidating content, bridging conceptual gaps, infusing significance, and establishing relevance. This approach is underscored by its ability to seamlessly connect academic material with the practicalities of everyday life and the pressing socio-economic issues.

Within Chapter 4, the contextual intricacies in group work unfolded, influenced by four key determinants. These determinants encompassed the selection of the meeting platform, the prevailing group work environment, the dynamics of participant interactions, and the group's capacity for decision-making. Notably, each participating group, on average, convened at least two face-to-face meetings. This observation unveiled a palpable presence of high epistemic agency within each group, reflecting their collaborative discussions' fluid and dynamic nature. Furthermore, participants consistently preferred collaborative group work, emphasising the value they derived from mutual assistance among peers. This noteworthy discovery aligns harmoniously with well-established studies rooted in

Sociocultural and Social Constructivism Theories (Kumpulainen & Kaartinen, 2000; Rogoff, 2003). These studies have consistently underscored the efficacy of learner-centric activities in conducive, collaborative environments that facilitate the sharing and co-construction of ideas and beliefs within a social context.

Participants consistently underscored the indispensable role of face-to-face discussions, a central theme elucidated within the study's findings. These discussions, they emphasised, served as pivotal arenas for in-depth exploration of research topics, facilitating the dissemination of knowledge within the group and fostering the collaborative generation of ideas. The ultimate aim was to complete the report and effectively present the group assignment. This study's outcomes echo the insights gleaned from prior research, notably Hmelo-Silver (2004) and Xu (2023). Participants conspicuously preferred face-to-face discussion platforms; such an inclination towards this mode of interaction portends promising implications for knowledge exchange and collaboration, aligning with Sociocultural and Social Constructivism Theories that emphasise the profound impact of interpersonal discourse on the learning process.

The participants overwhelmingly emphasised the significance of face-to-face discussions for their immediate networking benefits and potential to align with the core principles of knowledge-building. This preference stemmed from the understanding that face-to-face interactions allowed for the rapid exchange of ideas, continual feedback, and quick resolution of misunderstandings. This dynamic interaction fostered effective networking and created an environment conducive to genuine learning. Face-to-face meetings align with knowledge-building principles, as they promote collaborative discourse, shared idea development, and nurturing a tranquil learning environment that encourages critical engagement with subject matter and active participation in group work. This finding

highlights the vital role of discussions in constructing meaning and deepening comprehension, further underscoring the relevance of face-to-face talks in facilitating knowledge-building processes among participants.

Furthermore, this study sheds light on the profound impact of the group work environment on the dynamics of the collective learning process. Building upon Sociocultural and Social Constructivism Theories, particularly in group work, it is evident that the ambience in which students engage significantly influences the collaborative learning experience. This finding aligns with previous research conducted by London and Sessa (2007) and Rudsberg et al. (2017), who have explored the intricate interaction patterns within groups and their consequences on group dynamics.

The study delves into how these interaction patterns, cultivated by the group's environment, ripple through intrapersonal and interpersonal knowledge construction dimensions, as addressed in Research Question Three. It becomes apparent that the atmosphere in which group work transpires acts as a catalyst, shaping the cognitive and social processes central to knowledge-building. This critical insight underscores the essential role of the learning environment in shaping group dynamics and subsequently influencing the depth and quality of knowledge-building within the group.

The findings of this study also align with previous research by scholars such as Nokes-Malach et al. (2015), and Senior and Howard (2014), who have explored the connections between group interactions and the development of conceptual understanding. Participants in this study consistently recognised the significance of group interactions and relationship-building in actively engaging with the knowledge-building community and fostering a sense of belonging. This phenomenon is evident in the remarks made by the

participants, highlighting how the rapport they established with their group members evolved into a strong bond, ultimately shaping the group dynamics.

Consequently, this rapport fosters mutual understanding and collaboration within the group work context. This rapport arises from group members' better understanding of their collective tasks, facilitated by distributed expertise and active engagement. Moreover, they feel more at ease working with a group of friends, which enhances communication and the exchange of information.

The findings of this study underscore the effectiveness of collaborative knowledge-building within group discussions. These observations align with critical knowledge-building principles and theories from Sociocultural and Social Constructivism. It becomes evident that the advantages of collaborative group work outweigh solitary individual learning, as borne out by group interactions. Participants who engaged effectively in collaborative efforts with their peers exhibited a more profound comprehension of the subject matter as they actively exchanged ideas and engaged in meaningful communication. Furthermore, these participants demonstrated a heightened perception of the practical relevance of economic issues by actively connecting them to their own learning experiences, thus emphasising the socio-cultural aspects of knowledge-building in a collaborative context.

Furthermore, the intricacies of interconnectivity and interrelatedness among group members are related to the process of relationship building. Participants explicitly emphasised this point when recounting their group formation experiences, highlighting its pivotal role in fostering awareness of their roles and responsibilities as collaborative group members. This finding resonates with the conclusions drawn by Senior and Howard (2014), who found that engaging in discussions with group members greatly enhances participants'

understanding of theoretical concepts by applying them to real-world scenarios. It also underscores the authenticity elements inherent in the knowledge-building process, a concept illuminated by Scardamalia and Bereiter (2010). This interplay between relationships and authentic learning experiences within a group context showcases the profound impact of Sociocultural and Social Constructivism Theories on knowledge-building.

Participants expressed a sense of agency and empowerment as they realised. They could actively choose the contemporary economic issues to focus on, translating their decisions into a feeling of ownership. This revelation aligns with Scardamalia and Bereiter's (2006) assertion that students gain a sense of empowerment when they take ownership of advancing knowledge frontiers through collaborative knowledge-building. It also finds resonance with the work of Åberg et al. (2010), who found that students preferred tasks that allowed them to assert ownership within the knowledge-building process. Consequently, participants collaborated effectively within their groups and demonstrated a heightened interest in engaging with complex economic issues. This finding underscores the role of Sociocultural and Social Constructivism Theories in shaping knowledge acquisition and ownership within a collaborative learning context.

Significantly, the contemporary real-world problems assigned to participants assume a pivotal role as they serve as the wellspring from which groups and their members draw to cultivate their understanding, ideas, and knowledge of economic issues. Observations revealed that real-life problems were a powerful motivator, spurring participants to engage more deeply and retain newfound knowledge. In subsequent interviews, participants indicated their intention to apply this knowledge judiciously in relevant contexts. This discovery closely aligns with prior research conducted by Dolmans et al. (2001) and Guest (2012), who underscored the indispensable 'real-life' dimension inherent in such problems.

5.2.1.2 Individual and Collective Responsibility Awareness

The second thematic thread delves into the awareness of individual and collective responsibilities. This theme aligns with and fortifies findings unearthed in previous studies (DiDonato, 2013; Järvelä & Järvenoja, 2011; Ucan & Webb, 2015). It substantiates the idea that individuals within a group engage in co-regulation, thereby potentially catalysing the development and enhancement of their self-regulated learning abilities. This co-regulation manifests through various means, such as scaffolding, intersubjectivity, exchanging ideas, facts, and explanations, and articulating plans, goals, and activities. It further materialises as participants reflect upon and refine their thinking, facilitating new understandings and revising their initial conceptions.

Additionally, this thematic exploration closely resonates with the insights gleaned from prior research (Ericksen & Dyer, 2004; London & Sessa, 2007; Muukkonen & Lakkala, 2009). These studies underscore the pivotal role of individual contributions within a group context, where they elucidate that every group member possesses the potential to make substantial contributions by capitalising on their distributed expertise. This extends to areas like planning, decision-making, and community coordination (Zhang et al., 2009), underpinning the idea that collaborative knowledge-building relies on all participants' collective empowerment and engagement.

The participants formed their groups independently, embarking on group work centred around real-life economic issues within this study. This approach necessitated participants to critically assess these economic concerns and formulate solutions—an authentic learning experience that could foster meaningful learning and equip them for navigating real-world work environments in the future. This authenticity aligns with a fundamental principle of knowledge-building, emphasising the importance of concurrent,

embedded, and transformative assessment, as assessment plays an integral role in pursuing knowledge advancement (Scardamalia & Bereiter, 2010).

Moreover, this study yields results substantiating previous research on self-regulation (Zimmerman, 2015), co-regulation, and shared regulation (Ucan & Webb, 2015). When faced with challenges in their group tasks, participants, rather than seeking immediate teacher assistance, proactively engaged in self-regulation and co-regulation, collectively steering their group towards collaborative problem-solving within a supportive learning environment. This mode of regulation significantly enriched their collaborative learning experiences, underscoring the shared responsibility for effective learning. Furthermore, the observed behaviours align with the findings of Lai and Law's (2006) study, which highlighted that less competent members can glean valuable insights through interactions with more competent peers.

Furthermore, this self-regulation process encompasses self-monitoring, self-motivation, and self-reflection, as elucidated in Chapter 4. As revealed in their interviews, participants actively govern their behaviours and influence the actions of fellow group members, giving rise to co-regulation (DiDonato, 2013). Additionally, group members enthusiastically embraced this regulatory approach as a shared endeavour, where they collectively strategised and envisioned the outcomes of their collaborative work. The participants' initiation of this regulatory approach aims to catalyse the development and utilisation of each group member's unique abilities, fostering individual and collective growth in understanding the dynamics of the real-world economy.

5.2.1.3 Collaborative Learning

The third theme, collaborative learning, aligns with the earlier observations that the group work environment catalysed collaborative learning, profoundly enriching the learning process. Here, members' knowledge-building hinged on one another's contributions to the discussion. Moreover, during their discussions, it became evident that group members, drawing upon synthesis and evaluation of each other's knowledge, engaged in robust self-evaluation and self-reflection, enriching their shared knowledge base and building upon their prior knowledge. This discovery resonates with the findings of Cohen and Lotan (2014) in a collaborative learning environment. It underscores the significance of recognising and valuing the diverse intellectual contributions made by group members, each bringing unique social values into the knowledge-building process. This collective effort drives the collective construction of knowledge, emphasising the socio-cultural nature of learning and the role of collaboration in constructing meaning.

Furthermore, the findings of this study align with earlier research (van de Pol et al., 2019; Webb & Mastergeorge, 2003) that illustrates how group members actively engage in supportive scaffolding behaviours. Within the group dynamic, members often seek assistance from those they perceive as experts, demonstrating a culture of mutual help-seeking and help-offering. This behaviour becomes particularly evident when group members explicitly acknowledge the value of their peers' knowledge and expertise, positioning them as vital sources of information and support (Jang, 2007). This collaborative knowledge exchange highlights the significance of collective learning within a socio-cultural framework, where the group's combined expertise drives knowledge-building.

The findings of this study align with Savery's (2006) emphasis on the essential role of scaffolding. They highlight that participants benefit from substantial instructional support

and metacognitive guidance until they attain self-sufficiency, particularly in a new learning environment. It is noteworthy that participants view scaffolding as a valuable complement to the knowledge-building process, helping them progress to the next stage of their group work, as elucidated in the findings of Research Question Three. This underscores the critical significance of structured support mechanisms within collaborative learning.

As detailed in Chapter 4, participants' reliance on support within their group work predominantly manifested through feedback for enhancing and critiquing one another's work, seeking assistance from fellow members when facing challenges in problem-solving, sharing information, and engaging in mutual learning. These collaborative behaviours underscore the embodiment of constructivist learning principles rooted in the perspectives of Piaget and Vygotsky. This alignment underscores the pivotal role of social interaction and knowledge-building in learning.

The study revealed a noteworthy aspect of positive interdependence in task allocation among group members. This observation resonates with the work of Davidson et al. (2014), which underscores how positive interdependence creates a shared incentive to collectively support one another's efforts in pursuit of shared objectives. This, in turn, encourages collaboration, the exchange of resources, interactive engagement, and constructive conflict resolution within the group dynamic. These dynamics are pivotal in fostering effective group learning and knowledge-building.

Moreover, allocating tasks and dividing labour into most participating groups unfolded seamlessly and organically. Group members demonstrated a collective agreement on the distribution of responsibilities, primarily driven by optimising task performance within time constraints. This observation aligns with the research by McKay and Sridharan (2023), which emphasises that positive interactions among team members engender a sense

of synergy, fostering effective communication and engagement among students. It also resonates with the findings of London and Sessa (2007), highlighting that active participation in achieving group expectations improves group members' enthusiastic motivation and augments individual and collective self-efficacy. These factors are instrumental in shaping a conducive environment for collaborative learning and knowledge-building.

Furthermore, a significant revelation from this study is that participants found the job distribution within their groups adequate and anticipated favourable outcomes from this approach. They recognised the positive interdependence among various tasks, acknowledging that this reduced the likelihood of academic procrastination. Within most of the observed groups, tasks were allocated among participants. In their interviews, participants expressed how this practice allowed them to concentrate on their responsibilities while benefiting from their peers' collective wisdom, especially when tackling the intricate facets of contemporary economic issues.

This finding resonates deeply with Xu's (2023) research, underlining that students prefer group work outcomes surpassing what can be achieved individually. It underscores the potency of collaborative strategies, like task distribution, in enhancing the learning experience and mitigating issues like procrastination, ultimately leading to more profound knowledge-building within the group context.

5.2.2 Research Question Two

Concerning the second research question, one theme is intellectual openness, related to types of productive discourse that emerged in knowledge-building in group work; open communication is practised and receptive to various ideas and perspectives exhibited.

5.2.2.1 The Emergence of Productive Discourse

The finding regarding selecting progressive discourse has yet to be extensively elucidated in prior literature. Among the progressive discourses encompassing explaining, expressing views, agreeing, asking questions, emphasising, and encouraging, participants consistently cited these as the most frequently employed within the group context. However, it is worth noting that this study reported that certain discourses, namely initiating an idea, evaluating, and brainstorming, were less commonly utilised during group work. This disparity in discourse selection unveils a nuanced aspect of group dynamics in the context of this research that merits further exploration and analysis.

The role of explanation is fundamental in resolving cognitive conflict. Students negotiate their perspectives with one another to resolve cognitive disputes. Students may clarify or rearrange material in new ways within their minds, distinguish and fill in gaps in their understanding, correct existing views or create unique ideas, and construct more elaborate conceptualisations while explaining and justifying their perspectives.

Particularly noteworthy is the insight gleaned from participants within Group 10, including A35, A36, A37, and A38, as illuminated in Chapter 4 under Research Question Three. Their interviews revealed that the strategic use of discourse, specifically techniques like asking questions and explaining, was pivotal in elevating their comprehension and knowledge of contemporary economic issues such as CDO and GFC. Take Participant A35, for instance, who was spurred into action by her inability to respond to inquiries posed by her group mate, A37. This deficiency prompted A35 to embark on a journey of self-reflection, leading her to critically examine her existing knowledge framework in the context of economic-related problems. This process spurred her to take ownership of her learning trajectory and devise a strategy to address her knowledge gaps.

Furthermore, the accounts of group members A36, A37, and A38 underscored the transformative impact of A35's explanations on their understanding of these complex issues. This illuminating example underscores the profound influence that the selection of discourses can have in motivating group members to actively engage in self-improvement and enhancement before sharing their insights with others. This aligns with knowledge-building principles, where collaborative discourse is instrumental in advancing collective understanding, and resonates with Sociocultural and Social Constructivism Theories, emphasising the role of social interaction in cognitive development and knowledge-building.

Combining these findings highlights a significant connection between progressive discourse and the knowledge-building process. This correlation arises from knowledge-building thriving within a purposeful learning community committed to expanding existing knowledge through meaningful discourse, as Byker et al. (2017) articulated. Additionally, these results align with previous research, such as those by Roscoe and Chi (2007), who found that asking and answering questions could enhance individuals' engagement in reflective knowledge-building processes. Furthermore, these findings resonate with studies like those by Elbers and Streefland (2000), which showed that students reconstructed their ideas through argumentation cycles to promote understanding, and with research highlighting the dynamic interplay between interpersonal and intrapersonal processes in meaning-making and argument construction, as demonstrated by Rudsberg et al. (2017).

5.2.2.2 Open Communication

The finding of open communication permeated the fabric of group discussions, serving as a cornerstone for most participants. Their collective aim was to complete group assignments through various discourses, prominently in face-to-face discussions. During

these interactions, participants exhibited a solid inclination to vocalise their ideas and engage in reasoned disagreements while justifying their stances.

Furthermore, it was evident that participants held the contributions of their fellow group members in high regard. This culture of respect and acknowledgement was palpable during subsequent interviews, whether conducted in a group or individually. It demonstrated their social engagement in discussions and activities surrounding shared tasks. This discovery closely aligns with the insights of Cohen and Lotan (2014), who emphasised the importance of recognising and valuing the intellectual contributions of fellow group members. This encourages open communication and fosters a more inclusive and constructive learning environment.

The findings of this study reveal a dynamic and evolving pattern in how participants engage in discourse processes. This dynamism is particularly noteworthy because it underscores the flexibility in participants' choice of discourses. This choice is not rigid but is somewhat influenced by various contextual factors, as explored in Research Question One. This aspect of discourse flexibility is intriguing as it sheds light on the nuanced nature of group work dynamics that foster knowledge-building. By recognising the adaptability of participants in selecting discourses based on context, this study contributes to our understanding of the complex interplay between group work and knowledge-building. It emphasises the importance of considering contextual factors when designing effective group learning environments, aligning with principles of knowledge-building that emphasise the significance of context-specific factors in promoting active engagement and collaborative knowledge-building.

Furthermore, the participants strategically employed a variety of discourses, such as seeking information, explaining, challenging, defending, supporting, and disagreeing, in the

intricate process of constructing what is termed 'common knowledge.' As elucidated by Elbers and Streefland (2000) and Mercer (2004), this concept highlights that the group discourse served as the crucible for dynamic interactions. Here, participants skilfully conveyed the validity of their perspectives, thereby shaping the collective understanding, ideas, and knowledge related to the complex economic issues under discussion. The orchestration of communication and group discussions played a pivotal role in synthesising newly acquired information with their existing knowledge reservoirs, catalysing an environment conducive to active knowledge-building among the participants. This nuanced interplay was instrumental in nurturing a co-constructed and mutually shared understanding among the group members.

The remarkable consistency of these results observed across the participating groups underscores the substantial pedagogical potential embedded within dialogic interactions. These interactions play a pivotal role in fostering the development of individual competencies in utilising relevant discourses, a sentiment strongly echoed by participants during interviews. As these groups engaged in discussions, their collective focus on the co-construction of well-founded judgements allowed them to discern and apply common explanation elements. Engaging in such genuine dialogues with fellow members proved instrumental in helping participants develop and meticulously refine their explanatory prowess, thus enhancing their overall understanding, ideas, and knowledge.

This finding seamlessly aligns with the research of Lin et al. (2014), wherein the authors expounded on how learners are inspired to pose more profound and meaningful questions when navigating emerging understandings. By immersing themselves in a dialogical exchange of ideas, students become better equipped to tackle authentic problems, resulting in a heightened capacity for elaboration and idea enhancement. In this context, the

quality and depth of interactions among students directly influence the extent to which ideas are elaborated upon and enriched.

5.2.2.3 Receptive to New Ideas and Perspectives

Participants exhibited a commendable receptivity to a spectrum of ideas and perspectives, even those in stark contrast to their own. This openness was particularly striking in Groups 1 and 7, where members held divergent views regarding pressing contemporary economic issues, such as the imposition of GST in Malaysia and the dynamics of free trade between Malaysia and China.

In subsequent interviews, participants from these groups revealed that their level of comprehension had noticeably improved. This transformation was attributed to their willingness to listen actively, carefully consider alternative viewpoints, and remain open-minded during discussions. This finding underscores the significance of fostering an open-minded attitude within knowledge-building discussions, aligning with the insights of prior studies conducted by de Jong (2015) and van Heijst et al. (2019). These studies, rooted in Sociocultural and Social Constructivism Theories, emphasise the pivotal role of open-mindedness in sustaining rich and productive knowledge-building dialogues.

Moreover, in line with established literature, this discovery aligns with prior research on social cognitive conflict (Dolmans et al., 2001; Zhang et al., 2009), which underscores the role of such conflict in fostering a collective drive to support team members' endeavours towards achieving shared objectives, as highlighted by Davidson et al. (2014). This finding further underscores the significance of communication interactions, which extend beyond maintaining team cohesion and progress to establish high expectations for quality outcomes among group members, as emphasised in the work of McKay and Sridharan (2023). This

situation becomes particularly pronounced when participants actively acknowledge gaps in their understanding of complex economic issues, echoing the insights presented by Wells (2002).

Furthermore, the findings of this study align closely with the research conducted by Byker et al. (2017) and Wells (2004), who conducted in-depth conversation analysis to explore the intricate dynamics of learning within collaborative environments. These findings are explicitly linked to the content presented in Chapter 4, as detailed in Table 4.4, where an array of social discourses that unfolded during physical meetings were meticulously examined. The study illuminates how participants actively employed conversational strategies such as explaining, questioning, suggesting, arguing, and sharing to construct shared meanings, echoing the crucial role of discourse in shaping the knowledge-building process.

Furthermore, participants were observed actively seeking resources to support their perspectives and gain acceptance from other group members. These actions align with knowledge-building principles that emphasise providing scaffolding for more productive and inclusive discourse (Lin et al., 2014)

Rather than simply employing diverse discourses in their communication, participants consciously adopted an open-minded approach within an environment of open communication, strategically fostering more effective collaboration by coordinating their interactions. Moreover, participants progressively recognised the significance of feedback from their group members, a realisation that, to a considerable extent, catalysed a willingness to critically reevaluate their initial viewpoints and actively engage in effective negotiation processes. These observations strongly suggest a compelling correlation between

participants' active involvement in group work and tangible indicators of knowledge-building processes.

The findings of this study critically echo Barron's (2003) insights into the pivotal role of intellectual intimacy within collaborative learning environments. Barron emphasised the profound connection between intellectual intimacy and the effective use of discourses that facilitate meaningful intellectual practices and productive engagement among learners.

A closer examination of the excerpts provided in Chapter Four reveals that participants took the initiative in orchestrating their face-to-face meetings. They actively engaged in collaborative problem-solving activities and supported fellow group members whenever needed. This alignment between this study and Barron's (2003) finding underscores the influence of Sociocultural and Social Constructivism Theories, emphasising the development of intellectual intimacy through discourse in collaborative learning settings.

In essence, students strategically employ words like "because" as cues during their interactions within group discussions. This can be vividly observed in the excerpts cited in Table 4.6, which pertain to the ongoing refinement of ideas concerning contemporary economic issues. This practice underscores a crucial aspect of the learning process: when peers predominantly step in to mediate critical moments, bridging knowledge gaps, students actively engage in problem-solving and comprehension through these verbal exchanges.

This phenomenon highlights the role of interthinking in creating a potent zone of proximal development (ZPD), aligning firmly with Sociocultural Theory. Within this ZPD, more proficient peers assume the role of mediators, assisting in collaborative tasks and managing complex challenges that may surpass individual capabilities. Moreover, this

finding resonates with Taar and Palojoki's (2022) study, which delves into inner thinking, shedding light on language's pivotal role in inter-thinking while tackling learning tasks.

5.2.3 Research Question Three

The theme that is related to research question three is meaning-making. This theme is connected to improvements in the ability to analyse prior and/or current knowledge gaps, enhanced comprehension, continual refinement of ideas, and advancement in knowledge regarding contemporary economic issues. Themes grouped under Research Questions One and Two are closely linked to the meaning-making process, developing the ability to make and communicate meaning through the acquisition and use of the language, as Mahn (2012) mentioned.

5.2.3.1 Improvements in the Ability to Analyse Prior and/or Current Knowledge Gaps

In this study, the participants' engagement in collaborative meaning-making processes exemplifies the dynamic nature of knowledge-building. Through discourse, participants intertwined their perspectives, leveraging each other's ideas to advance their reasoning collectively. Notably, this evolution was evident in their prior knowledge, enabling them to discern areas for improvement in their understanding, ideas, and knowledge. This observation aligns closely with the findings from a previous study by Rudsberg et al. (2017), affirming that learners construct meaning through interactions with their peers. This underscores the vital role played by both intermental and intramental processes in shaping meaning, in concurrence with the fundamental principles of Sociocultural Theory.

Furthermore, a noteworthy observation emerged regarding how participants leveraged their knowledge of economics to construct mental representations, as discussed in

Chapter 4. This particular revelation raises intriguing questions about the extent of participants' familiarity with contemporary economic issues. Thus, this study is a foundational step towards assessing whether such collaborative endeavours contribute to an elevated level of knowledge acquisition among students. To navigate the intricate terrain of fundamental economic issues and comprehend their interconnected nature, students must synthesise a growing reservoir of information and resources, forging vital connections among the ideas they generate. This revelation underscores the pivotal role of identifying knowledge gaps, prompting students to seek peer assistance and explore authentic information sources proactively. This heightened awareness is related to self-regulation, self-reflection, and self-motivation, integral components of the Self-Regulated Learning process (Zimmerman, 2015). As documented in Appendix J, the transformation witnessed among most participants reflects substantive shifts in their learning dynamics, firmly aligning with established tenets of Sociocultural and Social Constructivism Theories.

5.2.3.2 Enhanced Comprehension of Contemporary Economic Issues

An incisive analysis of collaborative learning within the participating groups reveals intriguing patterns of idea repetition and reconstruction. These patterns are pivotal in circulating, refining, and eventually accepting knowledge during group discussions. Notably, these findings resonate with the insights of Elbers and Streefland (2000), who astutely observed that small group discussions are uniquely suited to dissect the intricate process of idea migration and the ensuing negotiations that accompany mutual appropriation.

A fascinating cyclical nature emerges within the discussion, where ideas are repeatedly deliberated upon and applied to real economic problems. This iterative process of idea generation and refinement extends beyond mere discourse; it signifies the dynamic

diffusion of ideas within the discussion group and the organic expansion of collective knowledge.

Furthermore, upon close examination of Chapter 4, it became evident that the results exhibited substantial shifts in participants' comprehension and knowledge of contemporary issues such as money laundering, the global financial crisis, bitcoins, and the Great Recession. These transformations in knowledge are notably profound when juxtaposed with the findings of prior studies (Tang, 2003; Walstad, 2001). This discovery underscores this study's fundamental premise that knowledge does not exist in isolation within the confines of individual minds. Instead, it is a product of dynamic interactions within a social context, wherein members contribute diverse ideas and perspectives that facilitate the co-creation and sharing of novel insights. This finding strongly aligns with Rogoff's (2003) seminal work, accentuating the pivotal role of interaction among group members. It highlights the continuous, dynamic negotiation that transpires within the nexus of individual and social contexts, ultimately driving advancements in individual learning. It reinforces the essence of knowledge-building as an inherently collaborative process.

In general, the findings from this study underscore that a significant proportion of participants managed to achieve the expected levels of economic proficiencies, as categorised by Hansen's analysis (2001), ranging from levels one through five. However, it becomes apparent that not all participants reached the pinnacle, represented by level six. It involves the capacity to forge new economic frontiers by formulating probing questions illuminating novel economic issues warranting further investigation.

Interestingly, Group 3 emerged with a particularly noteworthy recommendation among the participating groups. They advocated tighter regulatory control over bitcoins by financial institutions, intending to pre-empt potential issues such as money laundering. This

pragmatic proposal exemplifies the potential for real-world impact that can arise from knowledge-building within collaborative group settings.

5.2.3.3 Continual Refinement of Ideas Regarding Contemporary Economic Issues

Despite the absence of academic staff during the group work, participants' practices mirrored the knowledge-building principles outlined by Scardamalia and Bereiter (2010). This alignment was particularly evident as participants grappled with authentic problems, drew upon authoritative sources of information, and continuously engaged in knowledge-building discourse to refine their ideas. Participants recognised that their learning transcended individual efforts; it was a collective endeavour that hinged upon integrating diverse opinions to nurture idea development. This discovery implies that participants proactively sought, acquired, and integrated information to address contemporary economic challenges.

The concept of knowledge undergoes a significant transformation within the realm of collaborative learning contexts, a transformation vividly illustrated in the excerpts presented in Chapter 4. In these discussions, the pursuit extended beyond the mere individual reproduction of knowledge; it encompassed the dynamic process of collaborative knowledge-building. This process entailed active listening, seeking clarifications, presenting persuasive arguments, and framing constructive criticisms, mainly when cognitive dissonance emerged. Participants effectively assumed the role of 'researchers,' diligently exploring authentic resources to extract general and context-specific information, adeptly tailoring these findings to the prevailing circumstances. Moreover, a key realisation among participants was that knowledge is far from static or preordained; it continually requires further elaboration and inherently depends on one's perspective. These insights underscored the notion that ideas are not immutable entities but rather fluid constructs subject to

reinvention, repetition, and reconstruction through the collective contributions of group members.

To comprehend the intricate landscape of real-world economic problems and their interconnections, participants must access an expanding array of information and resources while forging connections among the ideas they generate. It is intriguing to note a correlation between the continual improvement of ideas and knowledge enhancement. This finding aligns with van Aalst and Chan's (2007) results, who discovered that students contributed their ideas and assisted fellow members in refining them, progressively advancing them within the knowledge-building community. Nevertheless, a few participants needed help in grasping the significance of this transformative process. They still determined its potential future implications and applications.

Participants in face-to-face discussions complemented each other's understanding by providing explanations and answers, clarifying their perspectives. The results also shed light on participants' interactions, their active involvement in discussions, and their genuine interest in learning economics. Observations of these meetings provided valuable insights into the participants' actions while working on group assignments. Participants displayed a strong sense of commitment and unity within their groups, emphasising the emotional aspect of collaborative learning. This sense of togetherness highlights the affective dimension of their learning experiences, which resonates with Barron's (2003) findings. Barron noted that the dynamic interplay of meaning-making in discourse among participants is particularly significant in small, collaborative groups.

The findings of this study reveal that group members collaborated and worked progressively to enhance their understanding, ideas, and knowledge, actively engaging in knowledge-building discourse. This observation aligns with the findings of Hmelo-Silver

and Barrows (2008), where students took responsibility for advancing the group's collective understanding and built upon each other's thoughts to construct collaborative explanations. This collaborative process is particularly evident in Table 4.5, illustrating how participants acquired new insights and knowledge, leading to restructuring their prior understanding of contemporary issues.

5.2.3.4 Advancement in Knowledge Regarding Contemporary Economic Issues

Students recognised that various factors, including information searching, reliance on evidence-based data, collaborative peer learning, effective scaffolding, dynamic group discussions, distributed expertise, and active group work, facilitated their knowledge advancement. These factors indicate the application of the Self-regulated Learning Process (Zimmerman, 2015) in economic education. Notably, this process is particularly relevant in the initial phase, where participants develop self-efficacy, form outcome expectations, foster intrinsic interest, and hone task analysis skills such as planning, goal setting, and strategy choice.

It becomes evident that the participants emphasised the paramount significance of information searching, mainly focusing on evidence-based sources. This emphasis underscores the pivotal role of self-regulated learning, a concept closely aligned with the knowledge-building principles identified in the literature. Participants undertook proactive research initiatives driven by the absence of academic staff involvement in their group work endeavours. Consequently, in this collaborative knowledge-building endeavour, they actively embraced and assumed responsibility for co-regulated and shared-regulated learning processes, mirroring critical principles outlined by Scardamalia and Bereiter (2010).

Participants' evolving comprehension, ideas, and knowledge reflect the dynamic interplay between individual and social learning, a phenomenon rooted in Sociocultural and Social Constructivism Theories. Their journey through group work was characterised by a continuous negotiation of meaning, influenced by interactions with peers and the collaborative construction of knowledge. As participants engaged in group discussions, they showcased remarkable adaptability in their knowledge constructs. This adaptability stemmed from their capacity to assess their existing knowledge critically, strategically employ self-improvement tactics, and solidify their affirmations. This process was instrumental in their attempts to navigate complex contemporary issues, showcasing the practical application of their knowledge. Elliott and Balasubramanyam (2016) emphasise that students can enhance their critical thinking abilities, gain a deeper understanding of economic ideas, make sound judgements, and prepare for future occupations when they consistently connect economic topics with real-world contexts.

5.2.4 Research Question Four

The theme related to Research Question 4 is connectivity. Three sub-findings relate to this theme: enhanced proficiency in relating knowledge to contemporary economic issues, enhanced capability to link contemporary economic issues with prospects, and participants repositioning themselves on economic, social, and political issues.

5.2.4.1 Enhanced Proficiency in Relating Knowledge to Contemporary Economic Issues

Given that economic issues represent real-world problems, it is plausible to expect that participants in this research study could attain higher-order thinking skills, nurture creativity, and engage in knowledge synthesis. This, in turn, rendered their learning experiences more meaningful as they effectively forged intricate connections between their

acquired knowledge and its application in real-world contexts. These outcomes align with the findings of Dolmans et al. (2001) and Duch et al. (2001), which underscore the significance of grounding education in authentic, real-world problems to foster comprehensive learning and problem-solving abilities.

The findings in this study align with prior research (Dolmans et al., 2001; Mergendoller et al., 2000), emphasising that complex tasks involving real-world problems tend to foster more productive interactions compared to tasks characterised by well-structured problems and closed questions with a single correct answer. As existing literature substantiates, this alignment highlights the importance of incorporating real-world problem-solving into educational practices.

In Chapter 4, this finding underscores the notable progress made by participants in connecting their knowledge to real-world economic issues and future prospects, thereby fostering new perspectives on contemporary economic challenges. This achievement starkly contrasts the limitations highlighted in prior studies (Hansen, 2001; Meyer & Land, 2006; Tang & Robinson, 2004), which pointed out students' struggles in applying and transferring classroom knowledge to real-life contexts. The substantial improvement observed in this study suggests a promising shift towards more effective knowledge application and integration, highlighting the potential for enhancing educational approaches to bridge this gap further.

Furthermore, during their initial meeting, the participants drew upon their surface knowledge of specific economic issues. However, their understanding of economic issues deepened as the discussion progressed and evolved into a research-oriented discourse. Participants began to express a broader perspective encompassing macroeconomic elements and the interconnectedness of various aspects of knowledge; their satisfaction with the

subjects improved when studying economics by applying theories to the real world (Reimann, 2004).

This evolution in their discourse highlights the necessity of collaborative knowledge-building, where participants must apply their knowledge to real-world issues. This finding resonates with the study conducted by Deiglmayr and Spada (2011), which underscores how exposure to real-world problems encourages negotiation, problem posing, and problem-solving among students. It is also consistent with the research of Taconis et al. (2016), emphasising the importance of integrating relevant real-world contexts into subject matter instruction to unify content, bridge concepts, inject meaning, and create relevance by aligning with everyday experiences and societal matters related to the economy.

5.2.4.2 Enhanced Capability to Link Contemporary Economic Issues with Prospects

In how participants approached their respective group work, they also illustrate how participants engaged in discussions about their learning processes and the deepening of their understanding of economic issues. This shift indicates a strong interrelation between intermental and intramental processes (Vygotsky, 1978), significantly when participants interacted with others and became involved in group work focused on contemporary economic issues. This involvement led to the development of new understandings, ideas, and knowledge and a transformation in their thinking perspectives at a later stage.

In furtherance, the finding of this study demonstrates a clear linkage between student learning outcomes in group work and the application of knowledge to real-world situations. This demonstration is closely aligned with knowledge-building principles (Scardamalia & Bereiter, 2010), emphasising the practical utilisation of knowledge. The participants exhibited confidence and a high degree of capability in integrating knowledge with future

prospects. They showcased their innovativeness in applying their knowledge to unique circumstances and new situations. For instance, this could involve becoming responsible and ethically sound accountants, informed voters, or influencers of consumption trends.

As discussed in Chapter 4, most participants revealed their prior knowledge, highlighting epistemic and practical gaps. This realisation motivated them to engage actively in group work, steadily improving themselves. During the concluding interviews, the participants expressed their experiences with knowledge-building and growing confidence in applying their knowledge to real-world issues. This observation aligns with Sarnikar's (2015) perspective, emphasising the importance of providing students with real-world problems to offer an authentic experience of economists' work. For example, like participant A73 (see Appendix R), his hope was directed toward a specific future epistemic payoff. He commented, "*most probably is that everything happening in the world is always related to economics*."

5.2.4.3 Repositioning on Economic, Social and Political Issues

Furthermore, this finding on how participants repositioned themselves on contemporary economic issues highlights the importance of Sociocultural and Social Constructivism Theories in conceptual change (Scardamalia, 2002). Participants were observed to adopt an open-minded attitude (de Jong, 2015; van Heijst et al., 2019) during interactive discussions with their group members. As such, this facilitated participants' willingness to accept new perspectives after they reflected upon and compared them with their current views, enabling meaningful connections with contemporary issues.

Moreover, participants also shared that they could evaluate the practicability and relevancy of the new perspectives. They anticipated how their change of views would shape

their next course of action in responding to politics, society, and economic issues. This finding signifies that participants could establish synergy between conceptual change and knowledge-building, mirroring the previous study by Lee (2010) on this perspective. Hence, participants' knowledge is perceived to have advanced positively from lower to higher levels, resulting from the change in attitude.

As mentioned earlier, participants were observed to demonstrate the ability to integrate new knowledge with their prior knowledge and experience. To enhance learning in a collaborative context, group members engage in group tasks when the task is shared and a real-world economic problem has to be solved. It helps the participants synthesise their perspectives to form a wider and broader one on the subject matter and grasp the complexity of such issues. Notably, the fact remains that participants did not learn in a vacuum because their learning is situated within a social context (Kumpulainen & Kaartinen, 2000; Rogoff, 2003).

Generally, individuals take opportunities to explore new forms of knowledge as they negate their pre-existing ability and reconstruct according to those discrepancies, which leads to new perspectives within the individual's mind. Changing perspectives causes the individual to acknowledge the new contradictory view while considering the current stance on a particular topic. Hence, individuals' knowledge is viewed to have positively advanced from lower to higher levels, resulting from the change in perspective either by widening the existing perspectives or offering potentially new perspectives.

The study revealed significant disparities between participants' pre-existing perspectives on contemporary economic issues and the information provided by their group members. The emergence of socio-cognitive conflict became evident when participants, with varying understandings of events, engaged in discussions, such as concerning implementing

GST in Malaysia. Notably, this cognitive dissonance triggered a conceptual shift in Participant A1, prompting a reconstruction of her knowledge base and reconsidering her budgeting strategies to mitigate the impact of GST. This discovery aligns with the findings of Roscoe and Chi (2007), emphasising that interactions within groups can lead to profound conceptual changes and a restructuring of individuals' knowledge frameworks.

Furthermore, participants recognised that their learning transcends individual efforts; it is a collaborative endeavour rooted in integrating diverse perspectives to foster continuous idea refinement. This observation aligns with the results of Zhang et al.'s (2009) research, where students' initial intuitive notions evolved towards greater epistemic complexity through their knowledge-building experiences.

Previous studies (Hansen, 2001; Meyer & Land, 2006; Tang & Robinson, 2004) have often highlighted students' challenges in applying their knowledge to real-world contexts. However, this study goes beyond these findings by conducting a more in-depth analysis, revealing the multifaceted applications of knowledge from students' perspectives, encompassing economics, social dynamics, politics, and ethics. This discovery is particularly striking as it suggests that most participants in this study foresee their ability to apply their knowledge in future contexts. They have developed a broader understanding of contemporary issues and a deeper awareness of the intricate interconnections between various events, which they now intend to employ practically.

Furthermore, participants displayed their capacity to integrate new knowledge with their existing understandings and personal experiences and demonstrated their ability to navigate collaborative environments effectively. This was particularly evident when they engaged in shared tasks to solve real-world economic problems. Such experiences expanded their perspectives, enabling them to develop a more comprehensive understanding of the

subject matter and a deeper awareness of the inherent complexities. However, it is essential to underscore that students' learning experiences are never isolated; they are related to the social context in which teaching and learning economics occur.

5.3 A Proposed Model for Teaching and Learning in Economics

The emergence of the six themes reflects the complex interplay of various factors within teaching and learning economics. Contextualisation underscores the importance of aligning economics content with real-world scenarios, fostering a practical understanding.

Individual and social awareness responsibility themes highlight the significance of individual reflection and social consciousness in the learning process, promoting responsible decision-making. Collaborative learning, another theme, indicates the value of group interactions and knowledge exchange, while intellectual openness emphasises the willingness to explore diverse perspectives and challenge existing notions.

The theme of intellectual openness played a pivotal role in facilitating collaborative knowledge-building. Participants' willingness to share ideas, ask questions, and express diverse viewpoints created a rich and dynamic learning environment. This openness encouraged the free exchange of ideas, ultimately contributing to the development of well-rounded perspectives on economic topics.

Moreover, meaning-making showcases the cognitive aspect of learning, demonstrating how students construct and derive significance from information. Lastly, connectivity signifies the holistic integration of these themes, emphasising the interconnected nature of these factors in enhancing the economics education experience. The theme of connectivity underscores the essential role of fostering meaningful connections among diverse concepts, theories, and real-world situations within economics education. It

signifies the students' ability to bridge theoretical knowledge with practical applications, enabling them to comprehend and address complex economic issues. This theme highlights the significance of equipping students with the skills to identify, analyse, and solve real-world economic challenges by drawing upon a holistic understanding of economic principles.

As Figure 5.1 shows, the model combines the themes of this study, demonstrating how contextualisation promotes individual and social responsibility awareness and strengthens collaboration. It showcases the influence of intellectual openness in promoting progressive discourse among students and highlights how students transition from meaning-making to establishing connections between their knowledge and real-world applications. A proposed model for teaching and learning in economics is developed through the lens of Sociocultural (1978) and Social Constructivism Theories (1970), integrated with the Self-regulated Learning Process (Zimmerman, 2015) and based on the conceptual framework of knowledge-building principles. This model will facilitate the knowledge-building and application processes by promoting the interplay between economics learning and real-world scenarios, empowering students to navigate the dynamic landscape of economics with a well-rounded perspective.

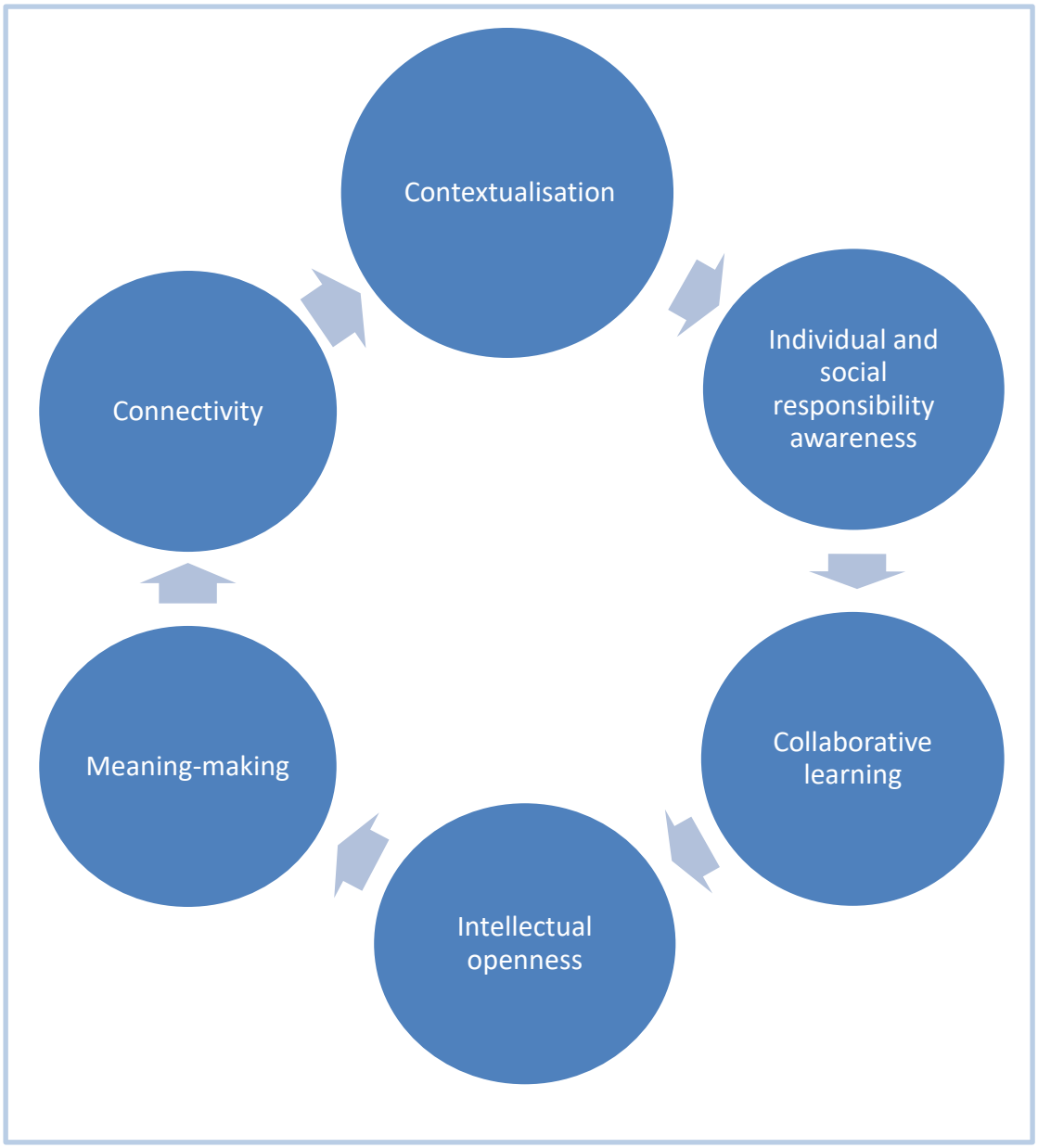


Figure 5.1: A Proposed Model for Teaching and Learning in Economics

5.4 Implications of the Study

The findings of this study have several important implications for understanding knowledge-building and application from students' perspectives in economics. Next, the discussion focuses on the theoretical, epistemological and practical significance relevant to teaching and learning economics that could support students' development in the knowledge-

building community. The following section discusses the study's theoretical, practical, and epistemological implications.

5.4.1 Theoretical Implications

The findings of this study provide a comprehensive view of how students engage in group work to address real-world problems, showcasing their collaborative knowledge-building process. It offers valuable insights into how students collaboratively tackle real-world problems within group settings, shedding light on their knowledge-building process.

This study demonstrates the practical implementation of Vygotsky's Sociocultural (1978) and Piaget's Social Constructivism Theories (1970), integrated with the Self-regulated Learning Process (Zimmerman, 2015), in group work for knowledge-building and application in economic education.

Clear evidence showed that group members sought and offered help, benefiting from these actions. The study drew upon a significant finding that extended the definition of scaffolding by illustrating the mutual benefits participants gained through this process. Additionally, participants showcased noteworthy instances of individual and social learning that enhanced their understanding, generated new ideas, and expanded their knowledge. Also, this study notably underscored the roles of assimilation and accommodation. This observation becomes particularly evident when delving into specific group dynamics (see Sections 4.2.1 and 4.2.2).

Furthermore, participants convened in self-initiated groups to brainstorm possible options, drawing from their existing knowledge and understanding. Their interest, curiosity, and prior knowledge of contemporary economic issues were activated and shared among

group members. As they progressed through the group work process, students also identified gaps in their knowledge (see Section 4.2.3).

While discussing the problem, encountering obstacles in their progress prompted students to seek additional information to facilitate their problem-solving journey, leading them to engage in higher-order thinking. Importantly, each time they encountered an obstacle, they took note, sought new knowledge or skills, and continued group discussions until solutions emerged. This finding also illustrates how participants adopted an epistemology consistent with Sociocultural and Social Constructivism Theories. In most groups, participants, whether individually or collectively, successfully built upon their knowledge (see Sections 4.2.1 and 4.2.2).

The theoretical implications of this study extend to educational practice. It suggests that educators and curriculum designers can benefit from adopting a more holistic approach to teaching and learning that incorporates collaborative group work, open communication, and self-regulation. The study underscores the importance of creating a conducive environment for students to actively engage with course content, connect it to real-world issues, and develop a deeper understanding of complex economic concepts. These theoretical implications can potentially inform instructional strategies and pedagogical approaches in economics education (see Section 4.2.4).

5.4.2 Practical Implications

Next, move on to the practical implications of this study. The findings highlight that students actively co-create knowledge, addressing doubts raised by their peers who spontaneously respond to queries within the dynamic knowledge-building environment. This discovery underscores the importance of incorporating students' voices, empowering them to take responsibility for their learning. It demonstrates the feasibility of enhancing group

work activities in economics education by integrating knowledge-building principles (see Sections 4.2.1 and 4.2.2).

The findings of this study also offer new insights to academic staff for designing group assessments that emphasise individual and collective learning within the framework of distributed expertise and students' prior knowledge. Another practical implication is to incorporate group work among students and select tasks that require abstraction and can stimulate differences of opinion. Additionally, scaffolding is recommended to support students as they work towards resolution. This discovery underscores the significance of applying economic knowledge involving a high level of cognitive activity (see Sections 4.2.1 and 4.2.2).

Furthermore, the findings observed in this study also reflect real-world problems, enhancing productive interaction within the group work context. Given that economic events constitute real-world issues, it is highly likely that participants can develop higher-order thinking skills by establishing connections with real-world settings (see Section 4.2.4).

Moreover, this study offers insights to academic staff in economics on how to scaffold student learning when students encounter difficulties in developing meaning and enhancing communication through verbal interactions in collaborative learning activities (Section 4.2.2). This scaffolding is essential for encouraging active and responsible student participation in their learning. Consequently, it is recommended that academic staff focus on substantially improving pedagogy, ensuring that teaching and learning have a genuine impact rather than merely adhering to recommended good practices. The outcome of this study has demonstrated the entire group process, evolving from context-dependent to practical application (see Sections 4.2.1 and 4.2.4).

In this group work context, students must be encouraged by their group members to openly express their ideas and engage consistently in knowledge-building discourse, where their contributions are meaningful within a participatory, collaborative learning environment (see Section 4.2.2). If such participative opportunities are rare, the new knowledge participants acquire remains to be compartmentalised. Consequently, participants are unlikely to connect their understanding with contemporary economic issues (see Section 4.2.3).

5.4.3 Epistemological Implications

This study highlights the application of knowledge to real-world problems, a facet that is only sometimes explicitly addressed in current tertiary-level economics studies. As a result, it contributes to our understanding of how knowledge-building processes manifest in group work settings when participants are involved in discourses, collaborate in task distribution, mutually support research activities, complement each other's contributions, and engage in active participation in discussions (see Sections 4.2.1 and 4.2.2).

Participants experienced the meaning-making process in small group discourse as a continuous journey of concept development through a dialogic and dialectic process mediated by language and interpretative efforts to discern the meaning of these concepts. Participants acknowledged the importance of face-to-face discussions, which are inseparable from the knowledge-building experience. This finding implies that the meaning-making process is fundamental to understanding how verbal interactions can generate new insights, ideas, and knowledge through collaboration in group work (see Section 4.2.2).

These findings from the study extend beyond current research that primarily focuses on individual students constructing understanding within a social learning context. This study emphasises the group work process, knowledge-building, and their applicability to

real-world problems. It is inspiring to observe how participants identified their prior knowledge and developed new insights, ideas, and knowledge, contributing significantly to the epistemic landscape of existing studies. Participants' ability to reflect on and advance their understanding, ideas, and knowledge within this context enhances the study's epistemic contributions. This demonstrates how the study's findings enrich our overall understanding of the topic and introduce fresh insights into existing knowledge (see Sections 4.2.3 and 4.2.4).

In summary, the findings of this study describe group work activities as a discussion process that necessitates students to cultivate interdependent relationships and gain social experience. These findings can serve as guiding principles in designing group work, especially to prepare students for participation in a knowledge-building community.

5.5 Limitations of the Study

In this study, these limitations primarily pertain to factors beyond the researcher's control that could influence the study's conclusions.

Firstly, the researcher acknowledges that an essential limitation of this study is its selection of a site that focuses on a private university. While the results of this study may not be readily generalisable to other public and private universities or beyond, they can still facilitate 'naturalistic generalisation' by allowing readers to assess the relevance of the research findings in new settings. Additionally, they can support 'analytic generalisation', in which the results are used to establish theoretical concepts and propositions considered in this research (Yin, 2011).

Indeed, generalisation is not the primary goal of qualitative research; the findings are not intended for broad generalisation to a larger population. Qualitative research enables

researchers to understand a phenomenon and acquire comprehensive insights into it deeply (Corbin & Strauss, 2008). Therefore, this study only aims to offer causal explanations of educational phenomena that can be universally applied to other settings. This is because what proves effective in one context may not necessarily be transferable to a new context.

Secondly, the study's sample size consisted of students enrolled in economics courses. Therefore, while the results are enriching and partly aligned with existing literature and learning theories, their applicability and relevance are limited to this specific group of participants within this particular setting. Still, the researcher knows that her presence may influence how the participants responded to interview questions. The researcher has upheld her independence and objectivity in conducting the interviews.

Thirdly, six out of the twenty-two groups that participated in this research study needed consent for the researcher to observe their face-to-face discussions. Consequently, for these six groups, primary data collection relied on group and individual interviews, chosen based on participants' preferences. In comparison, the data collected from these six groups may not be as comprehensive as that from the other sixteen groups.

5.6 Recommendations for Future Study

As the research study was exploratory in nature, involving twenty-two groups with a sample of eighty-six participants, these findings raise recommendations that warrant further investigation in response to the limitations outlined earlier.

To advance the study, it is imperative to expand the scope of data collection beyond a single private university to include other higher-level institutions. This broadens the study's reach and allows for a more comprehensive understanding of the phenomena under investigation. Future research endeavours should prioritise prolonged engagement and

persistent observation to gather richly detailed data for thorough analysis. This approach ensures the depth and quality of the findings, providing valuable insights into the subject matter.

Additionally, this study proposes a model for teaching and learning in economics that considers various factors, including contextualisation, individual and social responsibility awareness, collaborative learning, intellectual openness, meaning-making, and connectivity. This comprehensive model can be extended beyond economics to encompass other business subjects such as marketing, human resource management, and accounting in higher learning institutions. By applying this model across disciplines, educators can enhance the effectiveness of teaching and learning practices, fostering holistic development among students.

Furthermore, future studies should aim to replicate this research in diverse contexts, such as other higher-level institutions or with participants from different business subjects. Replicating the study across varied settings facilitates the identification of commonalities and differences, thereby enhancing the transferability of the findings and strengthening the validity of the research outcomes. By exploring variations across contexts, researchers can better understand the phenomena and its implications.

In addition to replication, future studies could consider conducting a comparative analysis between experimental and control economic groups. This examination will yield valuable insights into the effectiveness of the proposed model for teaching and learning in economics.

By addressing these recommendations, future studies can broaden the scope of inquiry, enhance methodological rigour, and promote practical applications of research findings.

5.7 Concluding On

Through an open avenue of communication in face-to-face discussions, participants actively engaged in progressive discourse, emphasising critical points and encouraging one another. In this group work context, rapport appears essential for participants to feel empowered to explore their thoughts and ideas through communication without fearing judgement from their group members. This study reaffirms these knowledge-building principles and extends the current understanding by emphasising the essential role of open communication within discourse. It advocates for participants to maintain an open-minded approach, allowing them to freely express consensus and contradictory views without stifling the discussion's atmosphere.

Group members enhance their learning by fostering relationships and encouraging them to participate in progressive inquiry. This engagement makes members feel like integral parts of the group rather than just passive recipients. Furthermore, they empower each other to take action, respond to inquiries from fellow members, and share their experiences in regulating the knowledge-building process. Consequently, they remained engaged, actively participated in group work, and communicated for individual and social improvement, ultimately contributing to developing their understanding, ideas, and knowledge. Additionally, group members take corrective actions and make necessary modifications within the feedback loop to drive continuous improvement.

Within the collaborative learning environment, specific examples encompassed a range of assistance, including problem-solving strategies, progressive discourse, the distribution of expertise related to allocated tasks, and the sharing of evidence-based information derived from research contributions by group members. These instances underscore the critical significance of scaffolding within the framework of ZPD.

Cognitive dissonance within group observations, especially when group members' perspectives clash, creates a disequilibrium state. This study sheds light on how these group members adeptly navigated these discrepancies to infuse meaning, comprehension, and mutual appreciation into their perspectives. Ultimately, this process catalysed their knowledge-building journey. However, not all immediately forged connections between their learning and real-world issues. This circumstance brings to the forefront the critical significance of self-regulation, co-regulation, and shared regulation within the group work context, as emphasised by the findings of this study. This finding is closely related to creating a group work environment that allows participants to establish personal and social significance and critical aspects of ongoing group activities and learning.

In conclusion, the findings reveal students' active engagement and enthusiasm for learning economics, underpinned by their interactions and collaborative efforts. Detailed observations of group meetings and insights from interviews offered valuable insights into the participants' commitment and teamwork as they tackled their assignments. This demonstrated a strong sense of mutual responsibility and cohesion, emphasising the affective dimensions of group work. Students could deepen their understanding, address misconceptions, and enhance their collective knowledge by exchanging explanations and answers. These dynamics underscore the critical role of peer interactions in fostering a supportive and effective group work environment.

REFERENCES

Åberg, M., Mäkitalo, Å., & Säljö, R. (2010). Knowing and arguing in a panel debate: Speaker roles and responsivity to others. In K. Littleton & C. Howe (Eds.), *Educational dialogues: Understanding and promoting productive interaction* (pp. 13–31). Routledge.

Alauddin, M., & Butler, J. E. (2004). Teaching economics in a changing university environment: Some Australian experience. *International Journal of Social Economics*, *31*(7), 706–720. https://doi.org/10.1108/03068290410540891

Albanese, M. A., & Mitchell, S. (1993). Problem-based learning: A review of literature on its outcomes and implementation issues. *Academic Medicine*, *68*(1), 52–81. https://doi.org/10.1097/00001888-199301000-00012

Albayrak, M., Yazıcı, N., & Şimşek, M. (2017). Relating the learned knowledge and acquired skills to real life: Function sample. *Higher Education Studies*, *7*(3), 148–160.

Allgood, S., Walstad, W. B., & Siegfried, J. J. (2015). Research on teaching economics to undergraduates. *Journal of Economic Literature*, *53*(2), 285–325. https://doi.org/10.1257/jel.53.2.285

Aman, I., & Mustaffa, R. (2006). Classroom discourse of Malay language lesson: A critical analysis. *Jurnal e-Bangi*, *1*(1), 1–24.

Anderson, H., Sweeney, C., Perry, R., Vaquero, J., & Ison, H. (2020). Patient-centered team-based learning in pre-clinical curriculum supporting the application of knowledge to real-world clinical experience. *Medical Science Educator*, *30*(1), 65–68. https://doi.org/10.1007/s40670-019-00872-5

Anderson, K. T., & Weninger, C. (2012). Tracing ideologies of learning in group talk and their impediments to collaboration. *Linguistics and Education, 23*(3), 350–360. https://doi.org/10.1016/j.linged.2012.06.005

Angrosino, M. V., & Mays de Perez, K. A. (2000). Rethinking observation: From method to context. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 673–702). SAGE Publications.

Arsaythamby, V., & Julinamary, P. (2015). Students' perception on difficulties of symbols, graphs and problem solving in economic. *Procedia - Social and Behavioral Sciences, 177*, 240–245. https://doi.org/10.1016/j.sbspro.2015.02.401

Arul, K. S. (2007, January 8–10). Making sense of economics: Designing educational scenarios for problem-based learning [Conference session]. *Creativity or Conformity? Building Cultures of Creativity in Higher Education Conference*, University of Wales Institute, Cardiff, and the Higher Education Academy, Cardiff, Wales.

Arvaja, M. (2005). Collaborative knowledge construction in authentic school contexts. *Research Reports 14*. Institute for Educational Research, University of Jyväskylä, Finland.

Arvaja, M., Salovaara, H., Ha¨kkinen, P., & Sanna, J. (2007). Combining individual and group-level perspectives for studying collaborative knowledge construction in context. *Learning and Instruction, 17*(4), 448–459. https://doi.org/10.1016/j.learninstruc.2007.04.003

Asano, T., & Yamaoka, M. (2015). How to reason with economic concepts: Cognitive process of Japanese undergraduate students solving test items. *Studies in Higher Education, 40*(3), 412–436. https://doi.org/10.1080/03075079.2015.1004240

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change.

Psychological Review, *84*(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology*, *4*(3), 359–373.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71–81). Academic Press.

Bandura, A. (2001). Social Cognitive Theory: An agentic perspective. *Annual Review of Psychology*, *52*(1), 1–26. https://doi.org/10.1246/cl.2002.558

Barron, B. (2003). When smart groups fail. *The Journal of the Learning Sciences*, *12*(3), 307–359. https://doi.org/10.1207/S15327809JLS1203

Bauer, G. (2003). *Summary Report: Qualitative assessment activities for Pew Grant on problem-based learning (PBL)*. https://www1.udel.edu/pbl/Final-Report-Pew-PBL.pdf

Birks, M., Chapman, Y., & Francis, K. (2008). Memoing in qualitative research: Probing data and processes. *Journal of Research in Nursing*, *13*(1), 68–75. https://doi.org/10.1177/1744987107081254

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, *5*(1), 7–74. https://doi.org/10.1080/0969595980050102

Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals*. Longman.

Blumenfeld, P. C., Marx, R. W., Soloway, E., & Krajcik, J. (1996). Learning with peers: From small group cooperation to collaborative communities. *Educational Researcher*, *25*(8), 37–40.

Boland, R. J., & Tenkasi, R. V. (1995). Perspective making and perspective taking in

communities of knowing. *Organization Science*, *6*(4), 350–372. https://doi.org/10.1287/orsc.6.4.350

Bowen, G. A. (2008). Naturalistic inquiry and the saturation concept: A research note. *Qualitative Research*, *8*(1), 137–152. https://doi.org/10.1177/1468794107085301

Brindley, J. E., Walti, C., & Blaschke, L. M. (2009). Creating effective collaborative learning groups in an online environment introduction: The challenge of creating effective study groups. *The International Review of Research in Open and Distributed Learning*, *10*(3), 1–10.

Bruffee, K. A. (1995). Sharing our toys: Cooperative learning versus collaborative learning. *Change: The Magazine of Higher Learning*, *27*(1), 12–18.

Brundiers, K., Wiek, A., & Redman, C. L. (2010). Real-world learning opportunities in sustainability: From classroom into the real world. *International Journal of Sustainability in Higher Education*, *11*(4), 308–324. https://doi.org/10.1108/14676371011077540

Butler-Kisber, L. (2018). *Qualitative inquiry: Thematic, narrative and arts-based perspectives (2nd ed.).* SAGE Publications.

Byker, E. J., Coffey, H., Harden, S., Good, A., Heafner, T. L., Brown, K. E., & Holzberg, D. (2017). Hoping to teach someday? Inquire within: Examining inquiry-based learning with first-semester undergrads. *Journal of Inquiry and Action in Education*, *8*(2), 54–80.

Cadiz, D., Sawyer, J. E., & Griffith, T. L. (2009). Developing and validating field measurement scales for absorptive capacity and experienced community of practice. *Educational and Psychological Measurement*, *69*(6), 1035–1058.

Cagliesi, G., & Ghanei, M. (2022). Team-based learning in economics: Promoting group

collaboration, diversity and inclusion. *The Journal of Economic Education*, *53*(1), 11–30. https://doi: 10.1080/00220485.2021.2004276

Cameron, M. P., & Lim, S. (2015). Recognising and building on freshman students' prior knowledge of economics. *New Zealand Economic Papers*, *49*(1), 22–32. https://doi.org/10.1080/00779954.2013.863721

Campbell, J. L., Quincy, C., Osserman, J., & Pedersen, O. K. (2013). Coding in-depth semistructured interviews: Problems of unitization and intercoder reliability and agreement. *Sociological Methods and Research*, *42*(3), 294–320. https://doi.org/10.1177/0049124113500475

Castillo-Montoya, M. (2016). Preparing for interview research: The interview protocol refinement framework. *The Qualitative Report*, *21*(5), 811–831.

Chan, C. K. K., & Chan, Y. (2011). Students' views of collaboration and online participation in knowledge forum. *Computers and Education*, *57*(2), 1445–1457.

Chan, C. K. K., & Tan, S. C. (2023). Knowledge building model for educational and pedagogical innovation and cultural-contextual influences. In W. O. Lee, P. Brown, A. L. Goodwin, & A. Green (Eds.), *International handbook on education development in Asia-Pacific* (pp. 1301–1325). Springer. https://doi.org/10.1007/978-981-16-2327-1_53-1

Chang. Y., Brickman. P., & Tanner, K. (2018). When group work doesn't work: Insights from students. *CBE—Life Sciences Education*, *17*(3), p.ar42-ar42.

Charmaz, K. (2006). *Constructing Grounded Theory: A practical guide through qualitative analysis*. SAGE Publications.

Chen, Y-C., Hand, B., & Park, S. (2016). Examining elementary students' development of oral and written argumentation practices through argument-based inquiry. *Science &*

Education, *25*(3–4), 277–320. https://doi.org/10.1007/s11191-016-9811-0

Chi, M. T. H. (2009). Active-constructive-interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science*, *1*(1), 73–105. https://doi.org/10.1111/j.1756-8765.2008.01005.x

Chidlow, A., Plakoyiannaki, E., & Welch, C. (2014). Translation in cross-language international business research: Beyond equivalence. *Journal of International Business Studies*, *45*(5), 562–582. https://doi.org/10.1057/jibs.2013.67

Cohen, E. G., & Lotan, R. A. (2014). *Designing groupwork: Strategies for the heterogeneous classroom* (3rd ed.). Teachers College Press.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). Routledge.

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research*: *Techniques and procedures for developing Grounded Theory* (3rd ed.). SAGE Publications.

Corden, R. (2001). Group discussion and the important of a shared perspective: Learning from collaborative research. *Qualitative Research*, *1*(3), 347–367.

Creswell, J. W. (1994). *Research design: Qualitative and quantitative approaches*. SAGE Publications.

Creswell, J. W. (2007). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). SAGE Publications.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative and mixed methods approaches* (3rd ed.). SAGE Publications.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.

Cross, P. K. (1998). Why learning communities? Why now? *About Campus*, *3*(3), 4–11.

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. Routledge.

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, *24*(2), 97–140. https://doi.org/10.1080/10888691.2018.1537791

Davidson, N., & Major, C. H. (2014). Boundary crossings: Cooperative learning, collaborative learning, and problem-based learning. *Journal on Excellence in College Teaching*, *25*(3&4), 7–55.

Davidson, N., Major, C. H., & Michaelsen, L. K. (2014). Small-group learning in higher education—Cooperative, collaborative, problem-based, and team-based learning: An introduction by the guest editors. *Journal on Excellence in College Teaching*, *25* (3&4), 1–6.

Davies, P., & Mangan, J. (2007). Threshold concepts and the integration of understanding in economics. *Studies in Higher Education*, *32*(6), 711–726. https://doi.org/10.1080/03075070701685148

Davies, W. M. (2009). Groupwork as a form of assessment: Common problems and recommended solutions. *Higher Education*, *58*(4), 563–584. https://doi.org/10.1007/s10734-009-9216-y

Davis, J. S. (2019). IQA: Qualitative research to discover how and why students learn from economic games. *International Review of Economics Education*, *31*(May), 100160.

de Jong, F. (2015). *Understanding the difference responsive education: A search for 'a difference which makes a difference' for transition, learning and education*. Wageningen: The Netherlands.

De Vos, A. S. (2002). *Research at grass roots: For the social sciences and human services professions* (2nd ed.). Van Schaik.

Deiglmayr, A., & Spada, H. (2010). Collaborative problem-solving with distributed information: The role of inferences from interdependent information. *Group Processes & Intergroup Relations*, *13*(3), 361–378. https://doi.org/10.1177/1368430209342259

Deiglmayr, A., & Spada, H. (2011). Training for fostering knowledge co-construction from collaborative inference-drawing. *Learning and Instruction*, *21*(3), 441–451. https://doi.org/10.1016/j.learninstruc.2010.06.004

DiDonato, N. C. (2013). Effective self-and co-regulation in collaborative learning groups: An analysis of how students regulate problem solving of authentic interdisciplinary tasks. *Instructional Science*, *41*(1), 25–47. https://doi.org/10.1007/s11251-012-9206-9

Dolmans, D. H., Wolfhagen, I. H., Vleuten, C. P., & Wijnen, W. H. (2001). Solving problems with group work in problem-based learning: Hold on to the philosophy. *Medical Education*, *35*(9), 884–889.

Driver, R., Newton, P., & Osborne, J. (2000). Establishing the norms of scientific argumentation in classrooms. *Science Education*, *84*(3), 287–312. https://doi.org/10.1002/(SICI)1098-237X(200005)84:3<287::AID-SCE1>3.3.CO;2-1

Duch, B. J., Groh, S. E., & Allen, D. E. (2001). Why problem-based learning? A case study of institutional change in undergraduate education. In B. J. Duch, S. E. Groh, & D. E. Allen (Eds.), *The power of problem-based learning* (pp. 3–11). Stylus Publishing, LLC.

Elbers, E., & Streefland, L. (2000). Collaborative learning and the construction of common knowledge. *European Journal of Psychology of Education*, *15*(4), 479–490. https://doi.org/10.1515/cercles-2015-0010

Elliott, C., & Balasubramanyam, V. (2016). Assessing students: Real-world analyses underpinned by economic theory. *Cogent Economics & Finance*, *4*(1), 1–8. https://doi.org/10.1080/23322039.2016.1151171

Engle, R. A., & Conant, F. R. (2002). Guiding principles for fostering productive disciplinary engagement: Explaining an emergent argument in a community of learners classroom. *Cognition and Instruction*, *20*(4), 399–484.

Ericksen, J., & Dyer, L. (2004). Right from the start: Exploring the effects of early team events on subsequent project team development and performance. *Administrative Science Quarterly*, *49*(3), 438–471. https://doi.org/10.2307/4131442

Farrokhnia, M., Pijeira-Díaz, H. J., Noroozi, O., & Hatami, J. (2019). Computer-supported collaborative concept mapping: The effects of different instructional designs on conceptual understanding and knowledge co-construction. *Computers & Education*, *142*(December), 103640.

Ford, E. J., & Leclerc, D. C. (2000). A constructivist approach to college-level economic education. *Review of Radical Political Economics*, *32*(3), 482–494.

Forslund Frykedal, K., & Hammar Chiriac, E. (2018). Student collaboration in group work: Inclusion as participation. *International Journal of Disability, Development and Education*, *65*(2), 183–198. https://doi.org/10.1080/1034912X.2017.1363381

Forsythe, F. (2010, October). *Problem-based learning*. https://economicsnetwork.ac.uk/handbook/pbl/

Furberg, A., & Arnseth, H. C. (2009). Reconsidering conceptual change from a socio-

cultural perspective: Analyzing students' meaning making in genetics in collaborative learning activities. *Cultural Studies of Science Education*, *4*(1), 157–191. https://doi.org/10.1007/s11422-008-9161-6

Ge, X., & Land, S. M. (2003). Scaffolding students' problem-solving processes in an ill-structured task using question prompts and peer interactions. *Educational Technology Research and Development, 51*(1), 21–38.

Geertz, C. (1973). *Thick description: Toward an interpretive theory of culture*. Basic Books.

Gentles, S. J., Charles, C., Ploeg, J., & McKibbon, K. (2015). Sampling in qualitative research: Insights from an overview of the methods literature. *The Qualitative Report*, *20*(11), 1772–1789.

Gilbert, N. J., & Driscoll, M. P. (2002). Collaborative knowledge building: A case study. *Educational Technology Research and Development*, *50*(1), 59–79.

Glaser, R. (1991). The maturing of the relationship between the science of learning and cognition and educational practice. *Learning and Instruction*, *1*(2), 129–144. https://doi.org/10.1016/0959-4752(91)90023-2

Goodman, R. J. (2010). Problem-based learning: The merging of economics and mathematics. *Journal of Economics and Finance*, *34*(4), 477–483.

Goodwin, C. (2000). Action and embodiment within situated human interaction. *Journal of Pragmatics*, *32*(10), 1489–1522.

Grapragasem, S., Krishnan, A., & Mansor, A. N. (2014). Current trends in Malaysian higher education and the effect on education policy and practice: An overview. *International Journal of Higher Education*, *3*(1), 85–93. https://doi.org/10.5430/ijhe.v3n1p85

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. SAGE Publications.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). SAGE Publications.

Guest, R. (2012). The case for integrating accounting, finance, and economics in teaching the GFC through a problem-based learning approach. *Journal of Business Ethics Education, 9*(Special Issue), 11–24.

Guest, R., & Duhs, A. (2002). Economics teaching in Australian universities: Rewards and outcomes. *Economic Record, 78*(241), 147–160. https://doi.org/10.1111/1475-4932.00020

Gunawardena, C. N., Lowe, C. A., & Anderson, T. (1997). Analysis of a global online debate and the development of an interaction analysis model for examining social construction of knowledge in computer conferencing. *Journal of Educational Computing Research, 17*(4), 397–431.

Halliday, M. A. K. (1993). Towards a language-based theory of learning. *Linguistics and Education, 5*(2), 93–116. https://doi.org/10.1016/0898-5898(93)90026-7

Hammar Chiriac, E. (2014). Group work as an incentive for learning – students' experiences of group work. *Frontiers in Psychology, 5*(558), 558.

Hammersley, M., & Atkinson, P. (1983). *Ethnography: Principle and practice.* Tavistock Publication Ltd.

Haneda, M., & Wells, G. (2008). Learning an additional language through dialogic inquiry. *Language and Education, 22*(2), 114–136. https://doi.org/10.2167/le730.0

Hansen, W. L. (2001). Expected proficiencies for undergraduate economics majors. *The Journal of Economic Education, 32*(3), 231–242.

Hansen, W. L., Salemi, K. M., & Siegfried, J. J. (2002). Use it or lose it: Teaching literacy

in the economics principles course. *American Economic Review*, *92*(2), 463–472.

Happ, R., Zlatkin-Troitschanskaia, O., & Förster, M. (2018). How prior economic education influences beginning university students' knowledge of economics. *Empirical Research in Vocational Education and Training*, *10*(5), 1–20. https://doi.org/10.1186/s40461-018-0066-7

Havnes, A., Christiansen, B., Bjørk, I. T., & Hessevaagbakke, E. (2016). Peer learning in higher education: Patterns of talk and interaction in skills centre simulation. *Learning, Culture and Social Interaction*, *8*(March), 75–87. https://doi.org/10.1016/j.lcsi.2015.12.004

Healy, G., & Walshe, N. (2020). Real-world geographers and geography students using GIS: Relevance, everyday applications and the development of geographical knowledge. *International Research in Geographical and Environmental Education*, *29*(2), 178–196.

Hennink, M. M., Kaiser, B. N., & Marconi, V. C. (2017). Code saturation versus meaning saturation: How many interviews are enough? *Qualitative Health Research*, *27*(4), 591–608. https://doi.org/10.1177/1049732316665344

Hesse, F., Care, E., Buder, J., Sassenberg, K., & Griffin, P. (2015). A framework for teachable collaborative problem solving skills. In P. Griffin & E. Care (Eds.), *Assessment and teaching of 21st century skills* (pp. 37–56). Springer.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, *16*(3), 235–266. https://doi.org/10.1023/B:EDPR.0000034022.16470.f3

Hmelo-Silver, C. E., & Barrows, H. S. (2008). Facilitating collaborative knowledge building. *Cognition and Instruction*, *26*(1), 48–94.

https://doi.org/10.1080/07370000701798495

Hofer, B. K. (2004). Exploring the dimensions of personal epistemology in differing classroom contexts: Student interpretations during the first year of college. *Contemporary Educational Psychology*, *29*(2), 129–163.

Hogan, K., Nastasi, B. K., & Pressley, M. (1999). Discourse patterns and collaborative scientific reasoning in peer and teacher-guided discussions. *Cognition and Instruction*, *17*(4), 379–432. https://doi.org/10.1207/S1532690XCI1704

Hong, H. Y., Chen, F. C., Chai, C. S., & Chan, W. C. (2011). Teacher-education students' views about knowledge building theory and practice. *Instructional Science*, *39*(4), 467–482. https://doi.org/10.1007/s11251-010-9143-4

Hung, W. (2006). The 3C3R model: A conceptual framework for designing problems in PBL. *Interdisciplinary Journal of Problem-based Learning*, *1*(1), 55–77.

Iedema, R., & Scheeres, H. (2003). From doing work to talking work: Renegotiating knowing, doing, and identity. *Applied Linguistics*, *24*(3), 316–337.

Inagaki, K., Hatano, G., & Morita, E. (1998). Construction of mathematical knowledge through whole class discussion. *Learning and Instruction*, *8*(6), 503–526.

Islam, S., & Manaloor, V. (2012). Teaching introductory economics to students of different majors: Challenges and opportunities. *Journal of Higher Education Theory and Practice*, *12*(1), 56–65.

Jang, S-J. (2007). A study of students' construction of science knowledge: Talk and writing in a collaborative group. *Educational Research*, *49*(1), 65–81. https://doi.org/10.1080/00131880701200781

Järvelä, S., & Järvenoja, H. (2011). Socially constructed self-regulated learning and motivation regulation in collaborative learning groups. *Teachers College Record*,

113(2), 350–374.

Järvelä, S., & Salovaara, H. (2004). The interplay of motivational goals and cognitive strategies in a new pedagogical culture: A context-oriented and qualitative approach. *European Psychologist, 9*(4), 232–244.

Johnston, C. G., James, R. H., Lye, J. N., & McDonald, I. M. (2000). An evaluation of collaborative problem solving for learning economics. *The Journal of Economic Education, 31*(1), 13–29. https://doi.org/10.1080/00220480009596758

Jonassen, D. H. (1997). Instructional design models for well-structured and ill-structured problem-solving learning outcomes. *Educational Technology: Research and Development, 45*(1), 65–94.

Jonassen, D. H. (2002). Engaging and supporting problem solving in online learning. *The Quarterly Review of Distance Education, 3*(1), 1–13.

Jorgensen, D. L. (1989). *Participant observation: A methodology for human studies*. SAGE Publications.

Joshi, P., & Marri. A. (2006) An economics methods course? Challenges of teaching an economics education methods course for secondary social studies preservice teachers. *The Social Studies, 97*(5), 197–202.

Kazak, S., Wegerif, R., & Fujita, T. (2015). The importance of dialogic processes to conceptual development in mathematics. *Educational Studies in Mathematics, 90*(2), 105–120. https://doi.org/10.1007/s10649-015-9618-y

Khoo, Y. Y. (2008). *Keberkesanan kaedah penyelesaian masalah secara kolaboratif dalam ekonomi tingkatan enam* [Unpublished doctoral dissertation]. Universiti Sains Malaysia, Penang, Malaysia.

Khoo, Y. Y. (2015). Collaborative problem solving promotes students' interest. *Journal of*

Economics and Economic Education Research, *16*(1), 158–167.

Khoo, Y. Y., & Abdullah, A. G. (2013). Learning in group: The effectiveness of collaborative problem solving on pre-university students. *Human and Social Science Research*, *1*(2), 105–111.

King, A. (1999). Discourse patterns for mediating peer learning. In A. M. O'Donnell & A. King (Eds.), *Cognitive perspectives on peer learning* (pp. 87–116). Lawrence Erlbaum Associates.

King, S., Greidanus, E., Carbonaro, M., Drummond, J., Boechler, P., & Kahlke, R. (2010). Synchronous problem-based e-learning (ePBL) in interprofessional health science education. *Journal of Interactive Online Learning*, *9*(2), 133–150.

Kittleson, J. M., & Southerland, S. A. (2004). The role of discourse in group knowledge construction: A case study of engineering students. *Journal of Research in Science Teaching*, *41*(3), 267–293.

Knight, S., & Littleton, K. (2015). Dialogue as data in learning analytics for productive educational dialogue. *Journal of Learning Analytics*, *2*(3), 111–143. https://doi.org/10.18608/jla.2015.23.7

Knowlton, D. S. (2003). Preparing students for educated living: Virtues of problem-based learning across the higher education curriculum. *New Directions for Teaching and Learning*, *2003*(95), 5–12. https://doi.org/10.1002/tl.107

Kumpulainen, K., & Kaartinen, S. (2000). Situational mechanisms of peer group interaction in collaborative meaning-making: Processes and conditions for learning. *European Journal of Psychology of Education*, *15*(4), 431–454. https://doi.org/10.1007/BF03172986

Kurasaki, K. S. (2000). Intercoder reliability for validating conclusions drawn from open-

ended interview data. *Field Methods*, *12*(3), 179–194. https://doi.org/10.1177/1525822X0001200301

Lai, M., & Law, N. (2006). Peer scaffolding of knowledge building through collaborative groups with differential learning experiences. *Journal of Educational Computing Research, 35*(2), 123–144.

Lee, C. B. (2006). *Capturing and assessing conceptual change in problem solving* [Unpublished doctoral dissertation]. University of Missouri, Columbia.

Lee, C. B. (2010). Generating synergy between conceptual change and knowledge building. *Human Development, 53*(3), 134–152. https://doi.org/10.1159/000315170

Lee, E. Y. C., Chan, C. K. K., & Aalst, J. Van. (2006). Students assessing their own collaborative knowledge building. *Computer-Supported Collaborative Learning*, *1*(1), 57–87. https://doi.org/10.1007/s11412-006-6844-4

Leedy, P. D., & Ormrod, J. E. (2015). *Practical research: Planning and design* (11th ed.). Pearson.

Leita, S. (2000). The potential of argument in knowledge building. *Human Development*, *43*(6), 332–360.

Lenkauskaitė, J., & Mažeikienė, N. (2012). Challenges of introducing problem-based learning (PBL) in higher education institutions: Selecting and using problems. *Social Research, 2*(2), 78–88.

Li, D., Remedios, L., & Clarke, D. (2010). Chinese students' perception of out-of-class group work in Australia. *The Australian Educational Researcher, 37*(3), 95–112. http://dx.doi.org/10.1007/BF03216932

Li, M., & Campbell, J. (2008). Asian students' perceptions of group work and group assignments in a New Zealand tertiary institution. *Intercultural Education*, *19*(3),

203–216. https://doi.org/10.1080/14675980802078525

Lin, K. Y., Hong, H. Y., & Chai, C. S. (2014). Development and validation of the knowledge-building environment scale. *Learning and Individual Differences, 30*, 124–132. https://doi.org/10.1016/j.lindif.2013.10.018

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications.

Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic education. *New Directions for Program Evaluation*, *30*(Special), 73–84.

Litchfield, A., Frawley, J., & Nettleton, S. (2010). Contextualising and integrating into the curriculum the learning and teaching of work-ready professional graduate attributes. *Higher Education Research and Development*, *29*(5), 519–534. https://doi.org/10.1080/07294360.2010.502220

London, M., & Sessa, V. I. (2007). The development of group interaction patterns: How groups become adaptive, generative, and transformative learners. *Human Resource Development Review*, *6*(4), 353–376. https://doi.org/10.1177/1534484307307549

Maher, C., Hadfield, M., Hutchings, M., & de Eyto, A. (2018). Ensuring rigor in qualitative data analysis: A design research approach to coding combining NVivo with traditional material methods. *International Journal of Qualitative Methods, 17*(1), 1–13. https://doi.org/10.1177/1609406918786362

Mahn, H. (2012). Vygotsky's analysis of children's meaning making processes. *International Journal of Educational Psychology*, *1*(2), 100–126. https://doi.org/10.4471/ijep.2012.07

Malaysian Qualifications Agency. (2011). *Guidelines to good practices: Curriculum design and delivery*. Malaysian Qualifications Agency.

Malaysian Qualifications Agency. (2018). *Malaysian Qualifications Framework (MQF)*

(2nd ed.). Malaysian Qualifications Agency.

Malmqvist, J., Hellberg, K., Möllås, G., Rose, R., & Shevlin, M. (2019). Conducting the pilot study: A neglected oart of the research process? Methodological findings supporting the importance of piloting in qualitative research studies. *International Journal of Qualitative Methods*, *18*, 1–11. https://doi.org/10.1177/1609406919878341

Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: Guided by information power. *Qualitative Health Research*, *26*(13), 1753–1760. https://doi.org/10.1177/1049732315617444

Mann, K., & MacLeod, A. (2015). Constructivism: Learning theories and approaches to research. In J. Cleland & S. J. Durning (Eds.), *Researching medical education* (pp. 51–65). John Wiley & Sons.

Maxfield, M. G., & Babbie, E. (2001). *Research methods for criminal justice and criminology* (3rd ed.). Wadsworth/Thomson Learning.

McCorkle, D. E., Reardon, J., Alexander, J. F., Kling, N. D., Harris, R. C., & Vishwanathan, I. R. (1999). Undergraduate marketing students, group projects, and teamwork: The good, the bad and the ugly? *Journal of Marketing Education*, *21*(2), 106–117.

McGorry, S. Y. (2000). Measurement in a cross-cultural environment: Survey translation issues. *Qualitative Market Research: An International Journal*, *3*(2), 74–81. https://doi.org/10.1108/13522750010322070

McKay, J., & Sridharan, B. (2023). Student perceptions of collaborative group work (CGW) in higher education. *Studies in Higher Education*, *49*(2), 221–234. https://doi.org/10.1080/03075079.2023.2227677

Mercer, N. (1996). The quality of talk in children's collaborative activity in the classroom.

Learning and Instruction, *6*(4), 359–377. https://doi.org/10.1016/S0959-4752(96)00021-7

Mercer, N. (2004). Sociocultural discourse analysis: Analysing classroom talk as a social mode of thinking. *Journal of Applied Linguistics*, *1*(2), 137–168. https://doi.org/10.1558/japl.2004.1.2.137

Mercer, N., & Howe, C. (2012). Explaining the dialogic processes of teaching and learning: The value and potential of sociocultural theory. *Learning, Culture and Social Interaction*, *1*(1), 12–21. https://doi.org/10.1016/j.lcsi.2012.03.001

Mergendoller, J. R., Maxwell, N. L., & Bellisimo, Y. (2000). Comparing problem-based learning and traditional instruction in high school economics. *The Journal of Educational Research*, *93*(6), 374–382.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. Jossey-Bass.

Meyer, J., & Land, R. (2006). *Overcoming barriers to student understanding: Threshold concepts and troublesome knowledge*. Routledge.

Ministry of Education Malaysia. (2015). *Malaysia Education Blueprint 2015-2025 (Higher Education)*. Ministry of Education Malaysia.

Ministry of Higher Education. (2010). *The future of economics and business management education in Malaysia*. Ministry of Higher Education Malaysia.

Mittelmeier, J., Rienties, B., Tempelaar, D., & Whitelock, D. (2018). Overcoming cross-cultural group work tensions: Mixed student perspectives on the role of social relationships. *Higher Education*, *75*(1), 149–166. https://doi.org/10.1007/s10734-017-0131-3

Morse, J. M. (2015). Critical analysis of strategies for determining rigor in qualitative

inquiry. *Qualitative Health Research*, *25*(9), 1212–1222. https://doi.org/10.1177/1049732315588501

Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods*, *1*(2), 13–22. https://doi.org/10.1177/160940690200100202

Muukkonen, H., & Lakkala, M. (2009). Exploring metaskills of knowledge-creating inquiry in higher education. *International Journal of Computer-Supported Collaborative Learning*, *4*(2), 187–211.

Nokes-Malach, T. J., Richey, J. E., & Gadgil, S. (2015). When is it better to learn together? Insights from research on collaborative learning. *Educational Psychology Review*, *27*(4), 645–656. https://doi.org/10.1007/s10648-015-9312-8

Noor, N. M., Aman, I., Mustaffa, R., & Teo, K. S. (2010). Teachers' verbal feedback on students' response: A Malaysian ESL classroom discourse analysis. *Procedia Social and Behavioral Sciences*, *7*(C), 398–405.

Nussbaum, E. M., & Edwards, O. V. (2011). Critical questions and argument stratagems: A framework for enhancing and analyzing students' reasoning practices. *Journal of the Learning Sciences*, *20*(3), 443–488. https://doi.org/10.1080/10508406.2011.564567

O'Doherty, R., Street, D., & Webber, C. (2007, June). *The skills and knowledge of the graduate economist: Findings of a survey conducted on behalf of the Royal Economic Society and the Economics Network.* *h*ttps://www.economicsnetwork.ac.uk/projects/employability2007full.pdf

O'Donoghue, T. (2007). *Planning your qualitative research project: An introduction to interpretivist research in education*. Routledge.

Onwuegbuzie, A. J., & Leech, N. L. (2007). *Sampling designs in qualitative research:*

Making the sampling process more public. Qualitative Report, 12(2), 238–254.

Ormerod, P. (2003). Turning the tide: Bringing economics teaching into the twenty-first century. *International Review of Economics Education, 1*(1), 71–79.

Paas, F. G. W. C., & van Merriënboer, J. J. G. (1994). Variability of worked examples and transfer of geometrical problem-solving skills: A cognitive-load approach. *Journal of Educational Psychology, 86*(1), 122–133.

Palincsar, A. S., & Herrenkohl, L. R. (2002). Designing collaborative learning contexts. *Theory into Practice, 41*(1), 26–32.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research, 42*(5), 533–544. https://doi.org/10.1007/s10488-013-0528-y

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. SAGE Publications.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). SAGE Publications.

Piaget, J. (1970). *Science of education and the psychology of the child*. Viking.

Pühringer, S., & Bäuerle, L. (2019). What economics education is missing: The real world. *International Journal of Social Economics, 46*(8), 977–991. https://doi.org/10.1108/IJSE-04-2018-0221

Punch, K. F. (2014). *Introduction to social research: Quantitative and qualitative approaches*. SAGE Publications.

Rasku-Puttonen, H., Eteläpelto, A., Häkkinen, P., & Arvaja, M. (2002). Teachers' instructional scaffolding in an innovative information and communication

technology-based history learning environment. *Teacher Development*, *6*(2), 269–287. https://doi.org/10.1080/13664530200200168

Reimann, N. (2004). First-year teaching-learning environments in economics. *International Review of Economics Education*, *3*(1), 9–38. https://doi.org/10.1016/S1477-3880(15)30147-X

Robson, C. (2002). *Real world research: A resource for social scientists and practitioner-researchers* (2nd ed.). Blackwell Publishing.

Rogoff, B. (2003). *The cultural nature of human development*. Oxford University Press.

Rojas-Drummond, S., & Mercer, N. (2003). Scaffolding the development of effective collaboration and learning. *International Journal of Educational Research*, *39*(1–2), 99–111. https://doi.org/10.1016/S0883-0355(03)00075-2

Roscoe, R. D., & Chi, M. T. H. (2007). Understanding tutor learning: Knowledge-building and knowledge-telling in peer tutors' explanations and questions. *Review of Educational Research*, *77*(4), 534–574. https://doi.org/10.3102/0034654307309920

Rowe, N. (2020). The great neoliberal hijack of collaboration: A critical history of group-based learning in tertiary education. *Higher Education Research & Development*, *39*(4), 792–805. https://doi.org/10.1080/07294360.2019.1693518

Rubel, D., & Okech, J. E. A. (2017). Qualitative research in group work: Status, synergies, and implementation. *The Journal for Specialists in Group Work*, *42*(1), 54–86. http://dx.doi.org/10.1080/01933922.2016.1264522

Rubin, H. J., & Rubin, I. S. (2005). *Qualitative interviewing: The art of hearing data* (2nd ed.). SAGE Publications.

Rudsberg, K., Östman, L., & Aaro Östman, E. (2017). Students' meaning making in classroom discussions: The importance of peer interaction. *Cultural Studies of*

Science Education, *12*(3), 709–738. https://doi.org/10.1007/s11422-015-9721-5

Rusznyak, L. (2020). Supporting the academic success of students through making knowledge-building visible. In C. Winberg, S. McKenna, & K. Wilmot (Eds.), *Building knowledge in higher education: Enhancing teaching and learning with legitimation code theory* (pp. 90–104). Taylor & Francis Group.

Ryan, G. W. (1999). Measuring the typicality of text : Using multiple coders for more than just reliability and validity checks. *Human Organization*, *58*(3), 313–322.

Sampson, H. (2004). Navigating the waves: The usefulness of a pilot in qualitative research. *Qualitative Research*, *4*(3), 383–402.

Sarnikar, S. (2015). *What can behavioral economics teach us about teaching economics?* Palgrave Macmillan. https://doi.org/10.1017/CBO9781107415324.004

Savery, J. R. (2006). Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem-based Learning*, *1*(1), 9–20.

Scardamalia, M. (2002). Collective cognitive responsibility for the advancement of knowledge. In B. Smith (Ed.), *Liberal education in a knowledge society* (pp. 67–98). Open Court.

Scardamalia, M., & Bereiter, C. (2003). Knowledge building. In J. W. Guthrie (Ed.), *Encyclopedia of Education* (2nd ed., pp. 1370–1373). Macmillan Reference.

Scardamalia, M., & Bereiter, C. (2006). Knowledge building: Theory, pedagogy, and technology. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 97–115). Cambridge University Press.

Scardamalia, M., & Bereiter, C. (2010). A brief history of knowledge building. *Canadian Journal of Learning and Technology*, *36*(1), 1–16.

Schmidt, H. G., Volder, M. L., Grace, W. S., Moust, J. H., & Patel, V. L. (1989). Explanatory

models in the processing of science text: The role of prior knowledge activation through small-group discussion. *Journal of Educational Psychology*, *81*(4), 610–619.

Seidman, I. (2006). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (3rd ed.). Teachers College Press.

Senior, C., & Howard, C. (2014). Learning in friendship groups: Developing students' conceptual understanding through social interaction. *Frontiers in Psychology*, *5*(September), 1–8. https://doi.org/10.3389/fpsyg.2014.01031

Singh, G., Hawkins-Waters, L., & Whymark, G. (2007). An integrated model of collaborative knowledge building. *Interdisciplinary Journal of E-Skills and Lifelong Learning*, *3*, 85–105. https://doi.org/10.28945/388

Sirias, D. (2005). Combining cooperative learning and conflict resolution techniques to teach information systems. *Journal of Education for Business*, *80*(3), 153–158.

Spencer, L., Ritchie, J., & O'Connor, W. (2003). Analysis: Practices, principles and processes. In J. Ritchie & J. Lewis (Eds.), *Qualitative research practice: A guide for social science students and researchers* (pp. 199–218). SAGE Publications.

Speziale, H. J., & Carpenter, D.R. (2007). *Qualitative research in nursing: Advancing the humanistic imperative* (4th ed.). Lippincott Williams & Wilkins.

Sridharan, B., Tai, J., & Boud, D. (2019). Does the use of summative peer assessment in collaborative group work inhibit good judgement? *Higher Education*, *77*(5), 853–870. https://doi.org/10.1007/s10734-018-0305-7

Starkey, K., Hatchuel, A., & Tempest, S. (2004). Rethinking the business school. *Journal of Management Studies*, *41*(8), 1521–1531. https://doi.org/10.1111/j.1467-6486.2004.00485.x

Starks, H., & Trinidad, S. B. (2007). Choose your method: A comparison of phenomenology, discourse analysis, and grounded theory. *Qualitative Health Research*, *17*(10), 1372–1380. https://doi.org/10.1177/1049732307307031

Stefanou, C. R., Stefanou, S. E., & Wen, F. I. (2007). Unifying theories of learning and economic decision making. *Education, Knowledge and Economy*, *1*(1), 5–17. https://doi.org/10.1080/17496890601128308

Steinemann, A. (2003). Implementing sustainable development through problem-based learning: Pedagogy and practice. *Journal of Professional Issues in Engineering Education and Practice*, *129*(4), 216–224. https://doi.org/10.1061/(ASCE)1052-3928(2003)129:4(216)

Strauss, P., & U, A. (2007). Group assessments: dilemmas facing lecturers in multicultural tertiary classrooms. *Higher Education Research & Development*, *26*(2), 147–161. https://doi.org/10.1080/07294360701310789

Sweller, J. (1994). Cognitive load theory, learning difficulty, and instructional design. *Learning and Instruction*, *4*(4), 295–312. https://doi.org/10.1016/0959-4752(94)90003-5

Sweller, J., Ayres, P., & Kalyuga, S. (2011). *Cognitive Load Theory*. Springer.

Sweller, J., van Merrienboer, J. J. G., & Paas, F. G. W. C. (1998). Cognitive architecture and instructional design. *Educational Psychology Review*, *10*(3), 251–296.

Taar, J., & Palojoki, P. (2022). Applying interthinking for learning 21st-century skills in home economics education. *Learning, Culture and Social Interaction*, *33*, 100615. https://doi.org/10.1016/j.lcsi.2022.100615

Taconis, R., den Brok, P. J., & Pilot, A. (2016). *Teachers creating context-based learning environments in science.* Sense Publishers.

Tan, J. S., & Chen, W. (2022). Peer feedback to support collaborative knowledge improvement: What kind of feedback feed-forward? *Computers and Education*, *187*,104467. http://doi: 10.1016/j.compedu.2022.104467

Tan, S. C., Chan, C., Bielaczyc, K., Ma, L., Scardamalia, M., & Bereiter, C. (2021). Knowledge building: Aligning education with needs for knowledge creation in the digital age. *Educational Technology Research and Development*, *69*(4), 2243–2266. https://doi.org/10.1007/s11423-021-10032-1

Tang, T. (2003). Understanding students' misunderstanding in economics. *Economic Analysis & Policy*, *33*(1), 157–171.

Tang, T., & Robinson, T. (2004). The effects of introductory economics course on students' beliefs and aptitudes in economics. *Australasian Journal of Economics Education*, *1*(2), 199–222.

Tartas, V., & Muller Mirza, N. (2007). Rethinking collaborative learning through participation in an interdisciplinary research project: Tensions and negotiations as key points in knowledge production. *Integrative Psychological and Behavioral Science*, *41*(2), 154–168. https://doi.org/10.1007/s12124-007-9019-6

Thornton, T. (2012). The economics curriculum in Australian universities 1980 to 2011. *Economic Papers*, *31*(1), 103–113. https://doi.org/10.1111/j.1759-3441.2011.00163.x

Ting, H., Chuah, F., & De Run, E. C. (2016). Knowledge sharing behaviour in innovative working environment: A case of a software developing company. *International Business Management*, *10*(10), 1989–1997. https://doi.org/10.3923/ibm.2016.1989.1997

Tobin, G. A., & Begley, C. M. (2004). Methodological rigour within a qualitative

framework. *Journal of Advanced Nursing*, *48*(4), 388–396. https://doi.org/10.1111/j.1365-2648.2004.03207.x

Ucan, S., & Webb, M. (2015). Social regulation of learning during collaborative inquiry learning in science: How does it emerge and what are its functions? *International Journal of Science Education*, *37*(15), 2503–2532. https://doi.org/10.1080/09500693.2015.1083634

van Aalst, J., & Chan, C. K. K. (2007). Student-directed assessment of knowledge building using electronic portfolios. *The Journal of the Learning Sciences*, *16*(2), 175–220. https://doi.org/10.1080/10508400701193697

van de Pol, J., Mercer, N., & Volman, M. (2019). Scaffolding student understanding in small-group work: Students' uptake of teacher support in subsequent small-group interaction. *Journal of Learning Sciences*, *28*(2), 206-239. https://doi.org/10.1080/10508406.2018.1522258

van Heijst, H., de Jong, F. P. C. M., van Aalst, J., de Hoog, N., & Kirschner, P. A. (2019). Socio-cognitive openness in online knowledge building discourse: Does openness keep conversations going? *International Journal of Computer-Supported Collaborative Learning*, *14*(2), 165–184. https://doi.org/10.1007/s11412-019-09303-4

van Oers, B. (1998). The fallacy of decontextualisation. *Mind, Culture, and Activity*, *5*(2), 135–142.

Vardi, I., & Ciccarelli, M. (2008). Overcoming problems in problem-based learning: A trial of strategies in an undergraduate unit. *Innovations in Education and Teaching International*, *45*(4), 345–354.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*.

Harvard University Press.

Walstad, W. B. (2001). Improving assessment in university economics. *Journal of Economic Education, Summer*, 281–294.

Walstad, W. B., & Rebeck, K. (2002). Assessing the economic knowledge and economic opinions of adults. *Quarterly Review of Economics and Finance*, *42*(5), 921–935. http://dx.doi.org/10.1016/S1062-9769(01)00120-X

Watts, M., & Becker, W. (2008). A little more than chalk and talk: Results from a third national survey of teaching methods in undergraduate economics courses. *Journal of Economic Education*, *39*(3), 273–286.

Webb, N. M., Franke, M. L., De, T., Chan, A. G., Freund, D., Shein, P., & Melkonian, D. K. (2009). "Explain to your partner": Teachers' instructional practices and students' dialogue in small groups. *Cambridge Journal of Education*, *39*(1), 49–70. https://doi.org/10.1080/03057640802701986

Webb, N. M., & Mastergeorge, A. (2003). Promoting effective helping behavior in peer-directed groups. *International Journal of Educational Research*, *39*(1–2), 73–97. https://doi.org/10.1016/S0883-0355(03)00074-0

Wells, G. (2002). Learning and teaching for understanding: The key role of collaborative knowledge building. In J. Brophy (Ed.), *Social Constructivist Teaching: Affordances and Constraints* (Vol. 9, pp. 1–41). Emerald Group Publishing Limited. https://doi.org/10.1016/S1479-3687(02)80004-9

Wells, G. (2004). *Dialogic inquiry: Towards a sociocultural practice and theory of education*. Cambridge University Press.

Wells, G., & Arauz, R. M. (2006). Dialogie in the classroom. *The Journal of the Learning Sciences*, *15*(3), 379–428. https://doi.org/10.1207/s15327809jls1503_3

Wolgemuth, J. R., Erdil-Moody, Z., Opsal, T., Cross, J. E., Kaanta, T., Dickmann, E. M., & Colomer, S. (2015). Participants' experiences of the qualitative interview: Considering the importance of research paradigms. *Qualitative Research*, *15*(3), 351–372. https://doi.org/10.1177/1468794114524222

Xu, S. (2023). Groupwork and collaborative learning: Chinese university students' struggles and strategies. *Higher Education Research & Development*, *43*(1), 227–242. https://doi.org/10.1080/07294360.2023.2215174

Xu, S., & Rajlich, V. (2005). Dialog-based protocol: An empirical research method for cognitive activities in software engineering. *IEEE*, 397–406.

Yew, E. H., Chng, E., & Schmidt, H. G. (2011). Is learning in problem-based learning cumulative? *Advances in Health Sciences Education: Theory and Practice*, *16*(4), 449–464. *https://doi.org/10.1007/s10459-010-9267-y*

Yin, R. K. (2011). *Qualitative research from start to finish*. Guilford.

Zhang, H. X. (2017). Accommodating different learning styles in the teaching of economics: With emphasis on Fleming and Mills's sensory-based learning style typology. *Applied Economics and Finance*, *4*(1), 72–83.

Zhang, J., Scardamalia, M., Reeve, R., & Messina, R. (2009). Designs for collective cognitive responsibility in knowledge-building communities. *Journal of the Learning Sciences*, *18*(1), 7–44. https://doi.org/10.1080/10508400802581676

Zimmerman, B. J. (2015). Self-regulated learning: Theories, measures, and outcomes. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (2nd ed., Vol. 21, pp. 541–546). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.26060-1

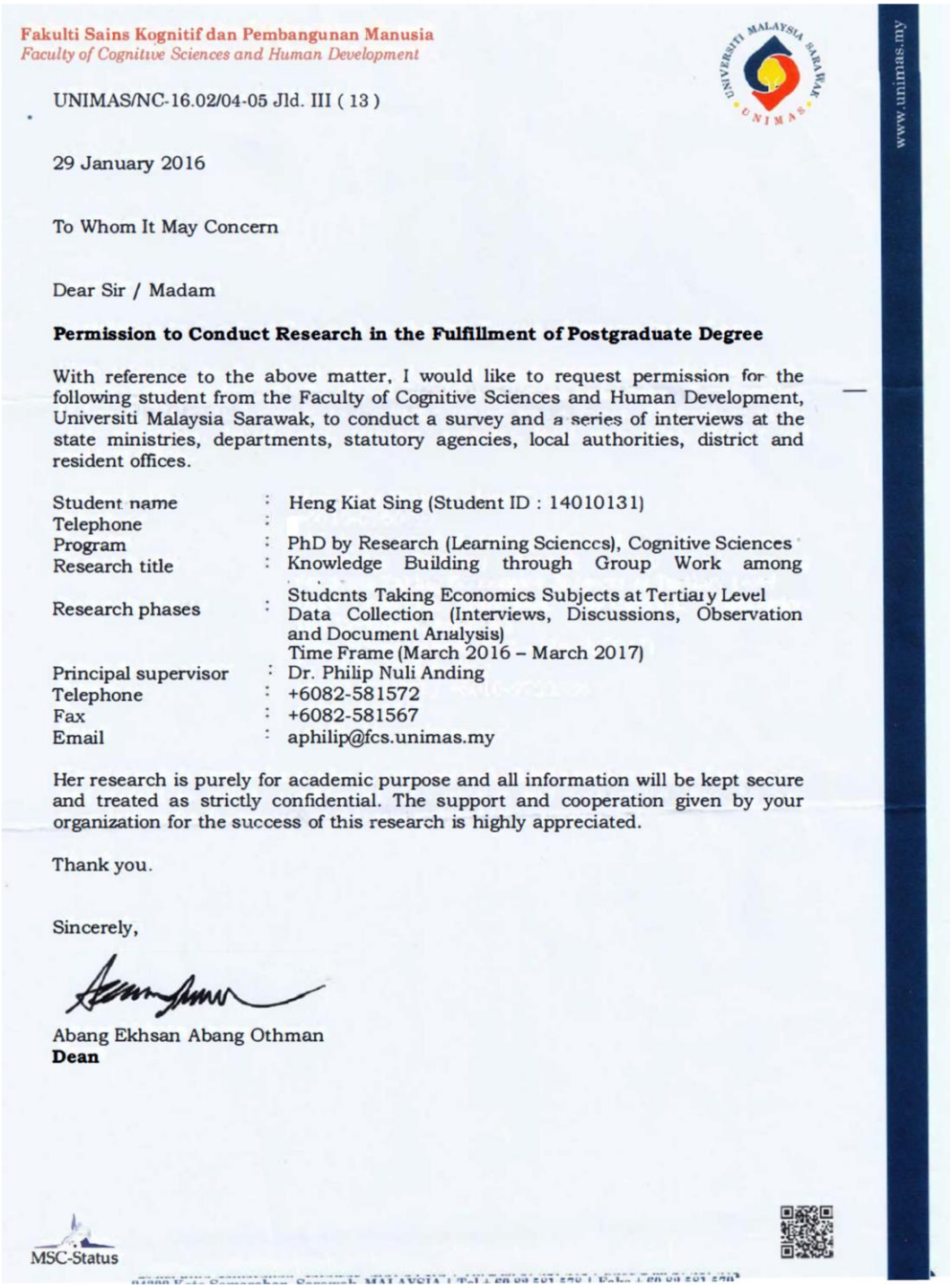
Zlatkin-Troitschanskaia, O., Pant, H. A., & Coates, H. (2016). Assessment & Evaluation in

Higher Education Assessing student learning outcomes in higher education: Challenges and international perspectives. *Assessment and Evaluation in Higher Education, 41*(5), 655–661. https://doi.org/10.1080/02602938.2016.1169501

Zutlevics, T. L. (2016). Could providing financial incentives to research participants be ultimately self-defeating? *Research Ethics*, *12*(3), 137–148. https://doi.org/10.1177/1747016115626756

APPENDICES

Appendix A: Permission to Conduct Research



Fakulti Sains Kognitif dan Pembangunan Manusia
Faculty of Cognitive Sciences and Human Development

UNIMAS/NC-16.02/04-05 Jld. III (13)

29 January 2016

To Whom It May Concern

Dear Sir / Madam

Permission to Conduct Research in the Fulfillment of Postgraduate Degree

With reference to the above matter, I would like to request permission for the following student from the Faculty of Cognitive Sciences and Human Development, Universiti Malaysia Sarawak, to conduct a survey and a series of interviews at the state ministries, departments, statutory agencies, local authorities, district and resident offices.

Student name	:	Heng Kiat Sing (Student ID : 14010131)
Telephone	:	
Program	:	PhD by Research (Learning Sciences), Cognitive Sciences
Research title	:	Knowledge Building through Group Work among Students Taking Economics Subjects at Tertiary Level
Research phases	:	Data Collection (Interviews, Discussions, Observation and Document Analysis) Time Frame (March 2016 – March 2017)
Principal supervisor	:	Dr. Philip Nuli Anding
Telephone	:	+6082-581572
Fax	:	+6082-581567
Email	:	aphilip@fcs.unimas.my

Her research is purely for academic purpose and all information will be kept secure and treated as strictly confidential. The support and cooperation given by your organization for the success of this research is highly appreciated.

Thank you.

Sincerely,

Abang Ekhsan Abang Othman
Dean

MSC-Status

www.unimas.my

Appendix B: Consent Form

Consent Form

Project Title: Knowledge building through group work among students taking economics subjects at the tertiary level

Investigators:

Heng Kiat Sing (PhD candidate and investigator)

Dr Philip Nuli Anding (Principal supervisor)

Dr Tan Kock Wah (Co-supervisor)

1. I consent to participate in the study named above. I have been provided a copy of the information sheet to which this consent form relates and any questions I have asked have been answered to my satisfaction.

2.

In relation to this study, please circle your response to the following:			
Phase 1: Observation			
a	I agree to be observed by the researcher during all meetings ***or*** discussions convened for the purpose of completing the relevant group work in an economics subject.	***Yes***	***No***
b	I agree to allow all meetings ***or*** discussions convened for the purpose of completing the relevant group work in an economics subject to be audio-recorded.	***Yes***	***No***
Phase 2: Interviews - Individual and/or Focus Group			
c	I agree to be interviewed by the researcher after each meeting ***or*** discussion convened for the purpose of completing the relevant group work in an economics subject.	***Yes***	***No***
d	I agree to allow each individual interview to be audio-recorded.	***Yes***	***No***
e	I agree to allow each focus group interview to be audio-recorded.	***Yes***	***No***
Other matters			
f	I agree to make myself available for further information if required.	***Yes***	***No***
g	I agree to make myself available to confirm on the content accuracy for the transcribed data if required and available.	***Yes***	***No***

3. I acknowledge that:
   (a) my participation is voluntary and that I am free to withdraw from the study by writing formally to the investigators at any time without explanation;
   (b) the study is for the purpose of research and not for profit;
   (c) any identifiable information about me which is gathered in the course of and as the result of my participating in this study will be (i) collected and retained for the purpose of this study and (ii) accessed and analysed by the investigators for the purpose of conducting this study;
   (d) my anonymity is preserved and I will not be identified in publications or otherwise without my express written consent.

By signing this document I agree to participate in this study.

Name of Participant: .....

Signature & Date: .....

Appendix C: Reviewers' Comments on Interview Protocol (Individual and Group)

Reviewer One	**Reviewer Two**	**Reviewer Three**
Share your experience in group formation.	Could you share with me how this group was formed?	How do you and your group members form this group?
How do you understand the requirement of this group assignment?	Tell me briefly what the group assignment is about.	What is the group assignment about? Tell me briefly what you know about this assignment.
How could discussion in group work lead to building of knowledge?	In what ways that discussions may help you to understand better on the subject content?	How important is the group discussion?
		Do you think the discussion has helped you understand/improve your knowledge of economics? How? In what ways?
Is there any interaction in your group? How?	Can you explain the interaction in your group?	How would you describe peer interaction in your group?
How could you contribute to improving the ideas of your group members?	How would you as a member of this group contribute and play a role in the completion of this group assignment?	What is your role in this group? How important is your role in this group?
Explain how the work is organised in your group.	How do you think sharing the responsibility and distribution of tasks among group members could lead to building of knowledge?	Is sharing the responsibility/distribution of tasks that happened among members in the group?

Appendix C continued

Was there any occasion during meetings when you contributed to improving the ideas of your group members?	In your opinion, was there any occasion when you contributed to improving ideas of your group members?	Share one incident (incidents) where you have helped the group to understand/ improve their knowledge of economics.
What are the sources of information that your group used in completing this group assignment?	What are the sources of information that you are using for this group assignment?	What are the resources that you use for this group assignment? How necessary are these resources?
In your opinion, in what way(s) does (do) researching on this topic contribute to building up the knowledge on economics?	In your opinion, in what way(s) does (do) researching on this topic contribute to building up the knowledge on economics?	Do you and your members conduct any research to complete this group assignment?
Do you face any challenges in completing the group assignment?	What challenges or difficulties are you and your members facing in completing this group assignment?	What are the challenges in completing the group assignment, if there is any?
Is there any change in your understanding/knowledge of economics compared to the beginning of the discussion?	Is there any change in your understanding/knowledge of economics compared to the beginning of the discussion?	Is there any change in your understanding/knowledge of economics compared to the beginning of the discussion?

Appendix C continued

Do you think group work help you to learn economics better? Why or why not?	In your opinion, in what way(s) does (do) group work via this assessment contribute to building up the knowledge on economics?	Share one incident where your understanding/ knowledge of economics has improved throughout this group work.
Is there any kind of support given by your group members?	How is your learning being supported in this group work?	How is your learning being supported in this group work?
Tell me something that you feel good about this group work.	What do you like most about this group work?	What do you like most about this group work?
Do you think group work is helpful for building up your knowledge in economics? Why or why?	Describe the knowledge-building process in your group work.	How would you describe your knowledge-building experience in this group work?
Is there any specific incident that you apply your knowledge to real-world events?	How do you apply your knowledge to real-world events?	In your opinion, do you think that you can apply your knowledge to other real-world events (s)? How and in what ways?

Appendix D: Observation Protocol

	Group No:
Observation – No:	

TRANSCRIPTION	
Recorder	**Participant Code:**
Date/Time:	**Venue**:
Duration:	**Name of Recorder:**
Transcriber:	**Transcribed on** (Insert date and time):

Turns	**Person**	**Description Notes**	**Reflective Notes**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Appendix E: General and Specific Interview Questions

No	Interview Protocol: (Individual and Group)	Research Questions (RQ)
1.	How do you and your group members form this group?	General
2.	What is the group assignment about? Tell me briefly what you know about this assignment.	General
3.	How important is the group discussion?	Specific: RQ1
4.	Do you think the discussion has helped you understand/improve your knowledge of economics? How? In what ways?	Specific: RQ2
5.	How would you describe peer interaction in your group?	Specific: RQ2
6.	What is your role in this group? How important is your role in this group?	Specific: RQ1
7.	Is sharing the responsibility/distribution of tasks that happened among members in the group?	Specific: RQ1
8.	Share one incident (incidents) where you have helped the group to understand/ improve their knowledge of economics.	Specific: RQ3
9.	What are the resources that you use for this group assignment?	Specific: RQ1
10.	How necessary are these resources?	Specific: RQ1
11.	Do you and your members conduct any research to complete this group assignment?	Specific: RQ1
12.	What are the challenges in completing the group assignment, if there is any?	Specific: RQ1

Appendix E continued

13.	Is there any change in your understanding/knowledge of economics compared to the beginning of the discussion?	Specific: RQ3
14.	Share one incident where your understanding/ knowledge of economics has improved throughout this group work.	Specific: RQ3
15.	How is your learning being supported in this group work?	Specific: RQ1
16.	What do you like most about this group work?	Specific: RQ1
17.	How would you describe your knowledge-building experience in this group work?	Specific: RQ4
18.	In your opinion, do you think that you can apply your knowledge to other real-world events (s)? How and in what ways?	Specific: RQ4

Appendix F: First level and Second level codes, Themes, Definition and Research Questions

First level codes	**Second level Codes**	**Themes**	**Definition**	**Research Questions**
Benefits of physical meeting	Context	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Indicating constraint	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Information searching	Positive interdependence	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Information sharing	Positive interdependence	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Job distribution	Positive interdependence	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Offering help	Scaffolding	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One

Appendix F continued

Proving feedback	Scaffolding	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Relationship building	Relationship building	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Self-evaluating	Self-regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Self-reflecting	Self-regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Self-regulating	Self-regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Shared regulation	Shared regulation	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One

Appendix F continued

Recollecting	Self-regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Seeking opinion	Peer learning	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Explaining	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Making judgement	Change of perspective	Connectivity	Interconnectedness of data to real world events that improve and enrich the learning process.	Four
Making inferences on interrelated issues	Improvement on understanding	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Connect the identified issues to real-world	Relevancy of knowledge	Connectivity	Interconnectedness of data to real world events that improve and enrich the learning process.	Four
Acknowledging contribution	Shared regulation	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One

Appendix F continued

Agreeing	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Arguing	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Asking question	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Complementing an earlier idea	Peer learning	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Emphasising	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Encouraging	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Expressing view	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Making assumption	Identification of knowledge gap	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three

Appendix F continued

Planning	Collaborative problem solving	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Practical application	Application to future prospects	Connectivity	Interconnectedness of data to real world events that improve and enrich the learning process.	Four
Praising	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Predicting	Improvement on understanding	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Suggesting	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Complementing an earlier idea	Peer learning	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Volunteering	Self-regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One

Appendix F continued

Academic procrastination	Self-regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Ambience	Ambience	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Benefits of group discussion	Positive interdependence	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Benefits of group work	Positive interdependence	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Benefits of job distribution	Positive interdependence	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Building confidence	Autonomy	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Change of perspective	Change of perspective	Connectivity	Interconnectedness of data to real world events that improve and enrich the learning process.	Four

Appendix F continued

Co-regulation	Co-regulated learning	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Flexibility in topic selection	Autonomy	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Improved understanding	Improvement on understanding	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Improvement in knowledge	Improvement on knowledge	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Knowledge-building	Continual improvement of ideas	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Connect issues to future workplace	Application to future prospects	Connectivity	Interconnectedness of data to real world events that improve and enrich the learning process.	Four
Alternative meeting platform	Ambience	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One

Appendix F continued

Collaboration	Collaborative problem solving	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Compromise	Positive interdependence among members	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Context dependent	Context	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Economic issues	Relevancy of knowledge	Connectivity	Interconnectedness of data to real world events that improve and enrich the learning process.	Four
Group dynamic	Collaborative problem solving	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Connect issues to future event	Application to future prospects	Connectivity	Interconnectedness of data to real world events that improve and enrich the learning process.	Four
Motivation	Self-regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One

Appendix F continued

Setting goal	Shared regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Tasks in group discussion	Positive interdependence among members	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Team diversity	Context	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Virtual discussion	Ambience	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Accepting feedback	Open-minded	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Admitting own mistake	Open-minded	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Advising	Open-communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Analysing the situation	Identification of knowledge gaps	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three

Appendix F continued

Assuring	Scaffolding	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Brainstorming	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Comforting	Scaffolding	Collaborative learning	students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Comparing	Identification of knowledge gaps	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Confirming	Scaffolding	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Correcting an earlier idea	Open-communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Defending	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two

Appendix F continued

Defining the issue	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Denying	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Directing	Co-regulation	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Disagreeing	Open-communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Evaluating	Discourse	Intellectual openness	a readiness to discuss different points of view and take into account alternate interpretations.	Two
Expressing annoyance	Open-communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Expressing concern - move to relationship building	Relationship building	Contextualisation	A particular environment or situation that the students find meaningful and pertinent.	One
Identification of knowledge gaps	Identification of knowledge gaps	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three

Appendix F continued

Assessing prior knowledge	Identification of knowledge gaps	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Expressing doubts	Identification of knowledge gaps	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Expressing excitement	Open-communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Expressing frustration	Open-communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Expressing surprise	Open-communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Expressing uncertainty	Open-communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Expressing worries	Open-communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two

Appendix F continued

Help seeking	Peer learning	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Identifying impacts of economic issues	Improvement of knowledge	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Indicating view	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Information seeking	Peer learning	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Informing	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Initiating an idea	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Instructing	Co-regulation	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One

Appendix F continued

Introducing presentation outline	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Making analogy	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Organising ideas	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Providing alternative	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Reading aloud	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Advancement of knowledge	Improvement on understanding	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Seeking feedback	Peer learning	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Repeating	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two

Appendix F continued

Requesting	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Three
Sarcastic	Discourse	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Seeking clarification	Identification of knowledge gaps	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Seeking confirmation	Identification of knowledge gaps	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Self-motivating	Self-regulated	Individual and social responsibility awareness	The acknowledgment and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Thinking	Self-regulated	Individual and social responsibility awareness	The acknowledgment and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One
Open communication	Open communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two

Appendix F continued

Open-mindedness	Open communication	Intellectual openness	A readiness to discuss different points of view and take into account alternate interpretations.	Two
Show clues	Peer learning	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Prior knowledge	Identification of knowledge gaps	Meaning-making	By relating new information or events to personal prior understanding, preexisting ideas, core values, and personal experiences.	Three
Problem solving	Collaborative problem solving	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Relevancy of research	Collaborative problem solving	collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Skill improvement	Self-regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One

Appendix F continued

Support from group members	Scaffolding	Collaborative learning	Students are together engaged in cognitively high-level construction of shared knowledge or understanding about the issues addressed.	One
Time management	Self-regulated	Individual and social responsibility awareness	The acknowledgement and comprehension of one's commitments and duties, both individually and collectively, in a learning setting.	One

Appendix G: Selected Quotations of Observations, Group and Individual Interviews

Item	First-level code	Observation 1	Observation 2	Observation 3	Group Interview	Individual Interview
		Selected Quotation	**Selected Quotation**	**Selected Quotation**	**Selected Quotation**	**Selected Quotation**
1	Information sharing	GST was invented by a French tax official in the 1950s, and today, over 160 nations practise this form of taxation. We will have examples later. Some of the countries include Sri Lanka, Singapore and China and over 90% of the world's population live in the countries with VAT or GST. (ID 1:249)	The second point is the role of Greek government. The Greek government is taking financial assistance from the neighbouring countries. Based on the article, the European Securities and Markets Authority also got help Greece, but however, got conditions of doing it. They also receive	The GDP growth here explains the growth of Singapore's GDP from the year before to 2018, the growth rises to 3.2%. (ID 47:43)	We all may have analysis that differ from each other. Some may have a certain source and the other no. So, sharing data among each other helps. (ID 3:29)	When my team members shared with me, I can combine them in a bigger idea. (ID 10:25)

Appendix G continued

			the bailout program, also like the kind of financial assistance but only got like 3 years or 5 years. (ID 6:17)			
2	Seeking opinion	So how much of GST rate should reduce to? Reduce to 4%; then gradually increase to a higher rate? Reduce to 4% or 3% (…). (ID 1:85)	In our recommendation, can we suggest Greece to leave Europe? (ID 10:203)	If A74 wants to explain the monetary policy using the graph also can, right? How about he wants to talk about graph but don't want to show the graph? I mean like just simply explain it like shifting the LM curve to the right. (ID 38:49)	For my part, if I not really understand, sometimes I not really understand and then I do my part, I ask my group members to check for me whether I am on the right track or not. (ID 5:12)	Yes, they often ask my opinion whether is right or wrong even I am not the tutor. (ID 8:22)

Appendix G continued

3	Explaining	The amount that Greece owes to others? If we think using our brain, the Greece economics crisis definitely affects Euro's currency. Because Greece uses Euro dollar, definitely it affects the Europe. This is the basic knowledge that we should know. (ID 10:82)	We look at the average growth of Islamic banks in the conventional banks in year 2009 to 2013, the average growth of 20% in Islamic banks compared to conventional banks of 19%. In terms of investment, there is a growth of 20% in Islamic banks compared to conventional banks with 18%. In terms of assets of the banks, the Islamic banks has the growth	Because paradox of thrift, people want to save more, causing the aggregate demand to fall. (ID 32:26)	Sometimes, I couldn't understand some topics inside the assignment but then my friends could explain it to me what the problem and about (...) will make more understand. (ID 38:38)	I explained to one of the members why he is supposed to use the exchange rate graph that is on exchange rate and income, output axis for explaining the exchange rate of the country. (ID 10:11)

Appendix G continued

			of 21% for the first 4 years and also the conventional banks have 19% for the first 4 years. And in terms of equity of the banks, Islamic banks have 24% while conventional banks have 27%. So around we can say that in Bangladesh, for the first four years, Islamic banking is doing really really well. (ID 13:63)			

Appendix G continued

4	Information searching	Based on the research, after the Lehman Brother collapsed on 15th September 2008, the global financial system has encountered an uncommon large contraction in an economy activity. (ID 4:10)	I did find out the related topic through our lectures. Lecture three on the balance of payment, and you see the Balance of payment framework there, there's current account. (ID 6:26)	Finance and insurance, wholesale, accommodation. These three. I searched for the reasons causing an increase rate for these three components. (ID 42:43)	Research more. Because I got some knowledge in this part, if I want to improve my confidence, I have to read through their research and then do my research also. (ID 2:31)	So, I did some research and trying to explain it in an easier way so that they can have a better understanding on it(lah) so like that. (ID 7:7)
5	Making inferences on interrelated issues	After the election of the newly Greek government, they (…) they didn't manage their country very well. The fiscal policy	The tariff reduction that caused by ACFTA implementation, based on what the researchers said that identified that	Ya, they also don't want to pay then they become default. Those loans (…) the banks repackage those loans and become CDO; they	Ya, the impacts of subprime debts lead to global financial crisis and in the presentation, she did mention about the aggregate demand	

Appendix G continued

		(…) you see the point number five, the fiscal deficit, affects the aggregate demand, C + I + G + (X-M), that means that their fiscal policy is not managed very well. And this also affects the households, investment, government, export and import. And you see the point number 3 that is the large deterioration of the projected deficit. This means that after	producers will be encouraged by lower tariffs to raise their import of inputs from China's suppliers to reduce production costs. China's suppliers can easily offer goods at lower prices which cause the domestic goods to be less competitive. Therefore, this brings to the consequence of crowding out the local businesses that	sell it to investors, investment banks, investment companies; investment banks sell to investors. This is how they link to each other, like a cycle, then, back to square one. This corner is a death end, another corner as well. (ID 24:132)	and also, the GDP, the economic growth and those things related to economy that it will increase or decrease something like that so help me to recall my economics subject. (ID 21:11)	Economy (…) more clear about how do they affect (…) what is the relationship between like interest rate and other export import some kind of things (…) the other like government do in what (…) for one action will affect the whole economy. (ID 2:12)

Appendix G continued

		the new Greek government of Greece is elected, it's through the market subprime and contamination crisis, most probably like countries that are now bankrupted and no more funds to be contributed to their citizens, ya, so worst. (ID 6:4)	supply similar inputs. This is evidenced by the machinery and electrical sector which was the highest trading volume for both countries. (ID 17:88)			
6	Relationship Building	You two tend to think alike. (ID 35:96)			We are more comfortable working with group of friends(lah) that we know so that it is	Relationship. I met with them. They are quite good as members in a team. (ID 8:35)

Appendix G continued

					easier for us to communicate and ah (…) exchange information. (ID 8:2)	
7	Job distribution	As for the parts, I will assign the jobs. (ID 6:48)	If everyone comes together, if someone hasn't read that part then it becomes very difficult. So, we should separate the tasks. (ID 12:61)	After we already know the requirement of question, we can divide the task and we can do it on our own, I think working like that is easier and more effective. (ID 47:24)	The tasks. Members chose the tasks based on their own strengths, competency and preference. (ID 9:10)	We divided the tasks, we did the general one on the research, then after that we configure them, and we did more specific research. (ID 9:23)

Appendix G continued

8	Providing feedback	What you done is very good, but of course you just to link it under another topic. You can say this one is on business establishment good relation bla bla bla; this one is profit-oriented in term of lending and getting money. (ID 11:86)	Because you put the chart, then you go too fast, people don't have the opportunity to review it, there are many wordings on the slide, like this. (ID 17:95)	Wait for a while, suddenly, I know what it's supposed to be. Can it be rephrased as 'Through private bond dealers, the Federal Reserve purchases government securities, and the payments will then deposit into the bank accounts of the individuals or organisations?' The meaning is the same. (ID 36:109)	More on team members, they will give me feedback on my part is it (...) it is appropriate to put the information in report or whether it is relevant to put it in the slides. (ID 24:54)	Yes, if your ideas is (are) wrong like you are doing the wrong thing, they can just correct you and give you alike opinions (…) I think is good. (ID 4:2)

Appendix G continued

9	Self-evaluating	The more that I think about it, I feel that something's not right. Because we got to link it to the election, then we got to provide a bit of background information to the lecturer. Actually, the focus is on the debt crisis. (ID 9:18)	We ourselves also not really understand. (ID 24:7)	What about finance insurance? Construction? This is so hard. I am not good in economics, I'm not joking. (ID 47:101)	I think my level of knowledge is better than theirs because I have to compile everything. So, I compile, I also read through and then maybe because after reading through everything, I have a grasp of knowledge so that's why maybe my confidence during the presentation is better(lah). (ID 2:35)	Individual work I can complete it but the quality of the assignment may not be so well compared to the work (in a group). (ID 6:9)

Appendix G continued

10	Shared regulation	Then we do it together. (ID 44:184)			I just feel like I like the commitment of all team members in this assignment. Although is a kind of an easy topic, but everyone just puts in all the effort that they can into this. (ID 13:20)	Especially for this economy assignment. We need to do a lot of collaboration and obtain help from the group members to complete their work. Doing it individually won't be able to ensure success for this unit. (ID 9:29)

Appendix G continued

11	Indicating constraint	My problem is I couldn't find information on how it affects Europe and the global (…) (ID 9:22)	But (I) couldn't find it. May consider to include the volume of traded goods in the chart. (ID 19:75)	I did my part on CDO till I feel (…) I feel that it is difficult to explain and make others understand what is CDO. (ID 24:9)	If it is done by individual, there's more research work have to be done individually. This will be a burden if it is done individually. (ID 14:31)	we were not like focusing more on each of our parts so we were like (…) we were just focusing like if I am going to take it individually then I am going to focus on the impacts then I may not come out with the animations to introduce to others how is CDO working, so hmmm (…) that is the disadvantage when I do it individual(lah). (ID 7:23)

Appendix G continued

12	Self-reflecting	If I recall, there's an exchange condition for the third bailout. (ID 24:128)	I keep on thinking and thinking (ID 26:12)	The next statement, money laundering may lead to unfathomable changes in money demand as well as cause the volatility of international capital flows, interest rates and exchange rates to increase. I don't understand why money laundering may lead to unfathomable changes in money demand? (ID 31:32)	Since I have some knowledge in my research field in my part, I will research on other GST related field and combine with my group members' research to improve my understanding and confidence in this topic. (ID 2:32)	To be honest, I don't really contribute in idea creation itself but then even though I have done some research and I try my best to understand the topic (ID 1:12)

Appendix G continued

13	Recollecting	If I recall, there's an exchange condition for the third bailout. (ID 9:88)	Just now, A13 mentioned that people rebel like this. Because people don't have the job opportunities, that's why they behave like this, these are the impacts. (ID 10:201)	Ya, in my high school, we did learn that the investment depends on the loans lend by banks, but now, we look at an overall rate. (ID 40:35)	At the beginning, we keep reading the article, and we actually don't know what is the Great Recession mean. (ID 36:38)	Like for Brexit in England in 2016 on a referendum that causes a drop in economy, how the government reacts to the drop in the economy, and how people react to it. (ID 10:32)
14	Self-regulating	Ya, will try our best. (ID 22:17)	I also need to read more. (ID 38:41)		I think working hard is very important in finishing the assignment and then getting the knowledge itself. (ID 26:63)	If a person can do a specific task properly, a person will do the quality job, this will actually reduce the stress and get the job done properly. (ID 9:16)

Appendix G continued

15	Benefits of face-to-face meeting	I think it's better for us to meet directly to discuss this assignment (ID 47:202)			For me I prefer the physical meeting because it is more easier for communication and you can observe the people's response. (ID 8:39)	I prefer the members attended the meeting so we could check the progress of the report (…) so we may have the difficulty to identify the problems if members didn't attend the meeting. (ID 6:1)
16	Making judgement	What I observe is at the beginning phase of GST implementation, it may not be good, but in the long term, it may stimulate the economy. Not really	Ya, for them (…) they are embarking to establish more relation and promote business; while this one is profit oriented, they really don't care about who	There're occasions where the monetary policy won't work. (ID 34:42)	Is about the monetary and fiscal policies. Our country is more depending to make sure the growth is well-coordinated. To make sure the	The main fluctuation of the UK economy is Brexit. There is uncertainty in the economy on the spending of the government. In UK, there are different

Appendix G continued

		mean that it is good at the initial stage of implementation, it is in the long term that it may stimulate the economy. (ID 1:142)	you are, ya, so I guess, that's good. (ID 11:84)		government is not over-spending and the society have enough money to spend and supply. (ID 29:55)	infrastructures for example Royal wedding; UK's currency is unstable, but after the Brexit, it may become more stabilised. (ID 9:7)
17	Offering help	If you have any question, then please ask me again. I will search the links for you. (ID 9:159)	You just add on "From the Qinzhou Port in South China's Guangxi Zhuang region and Kuantan, Malaysia", that's all. You come over here, let's explain to you one more time. (ID 17:65)	Sure, okay, if you need any help then do let me know (…) no stress, we got time till week 12. (ID 22:35)	A group have to be collaborative. We have to help each other. (ID 29:58)	I extend more support to my team members. (ID 8:36)

Appendix G continued

18	Connect the identified issues to real-world	This survey is a real one. (ID 42:1)			Because I always very interested in learning economics, because I think that is the only thing that I can apply in the real world and all the equations and graphs are all very interesting. (ID 35:60)	It teaches you what we learnt actually applicable to the real-world that is what we learnt can be applied in the economy. (ID 9:33)

Appendix H: Perceived Benefits of Face-to-face as The Preferred Meeting Platform

Perceived benefits of face-to-face meeting* platform ***Face-to-face meeting is used interchangeably with the physical meeting in interviews***	**Selected Quotations**
To facilitate communication	For me, I prefer the physical meeting because it is more easier for communication and you can observe the people's response (*Participant A9, Group 3's interview, dated: 22nd April 2016*). I think I prefer physical meeting because ah (…) everything will make like very clear. We can discuss the issues. I think we have the physical meetings, then we don't have (…) won't have the misunderstanding ya (…) because sometimes it is quite confused we using apps, you use your own understanding (…) (*Participant A10, Group 3's interview, dated: 22nd April 2016).*
To address uncertainties and clarify doubts	Through that (face to face), we are able to see maybe what you are trying to say (…) when we talk or when we meet here, we are able to argue different points and then look at (…) Maybe one person may not express herself properly on paper but then when they come to face to face, we exactly understand what the individuals want to say (*Participant A15, Group 5's interview, dated: 29th April 2016*). I think physical face to face is more better compare to virtual, for example like the most important one like content of the project, maybe we can talk to, physical is more easier; if talk through virtual, maybe other

Appendix H continued

	parties will misunderstanding what you actually want to express (*Participant A22, Group 6's interview, dated: 20th May 2016*).
To enhance comprehension and knowledge of subject matter	When during the physical meeting also, we Google things directly and showing graphs and everything, we can point out the mistakes that we did so it helps in improving our understanding (*Participant A45, Group 12's interview, dated: 4th November 2016*). For me, I think the physical meeting helps a lot because in order to understand economics, we have to sit together and discuss because when we used the WhatsApp, it cannot explain the language and cannot see the expression, ya (P*articipant A45, Group 12's interview, dated: 4th November 2016*).
To mitigate academic procrastination	For me, the physical meeting is quite important as well, because that I will be make sure that we are in the right path (*Participant A8, Group 3's interview, dated: 22nd April 2016*). Ya, I think it is easier to meet each other face to face and talking about the assignment because if we are using the WhatsApp or Line, it is quite difficult to communicate(lah), it is really easier to face-to-face to finish the assignment. (*Participant A85, Group 22's interview, dated: 3rd April 2019*).
To disseminate information	Ya, actually it is like to share what we know with each other in the physical meetings (*Participant A10, Group 3's interview, dated: 22nd April 2016*).

Appendix H continued

	For face to face, is important because we can meet each other and settle the solution right away, can research together at the same time, and find the sources that we want, the sources that the members wish to (*Participant A59, Group 15's interview, dated: 8th Nov 2017*).

Note: "Time" is "the date" to indicate when the interview was conducted.

Appendix I: Groundedness of Codes and Selected Quotations Related to Ambience Coded in Group Interviews

Group Number	Number of ambience quotations based on ATLAS.ti Code Document Report	Selected quotations
1	4	Quite democratic. To me is funny.
2	7	Sometimes we are so funny and then we share what we have done in our daily life.
3	4	We are quite harmony.
4	3	Sometimes can talk out of the topic (…) to release stress.
5	1	Absolute great!
6	3	Very efficient.
7	1	Fantastic. I like the team. I am very lucky in this team.
8	1	It is really nice (…) we work together ya.
9	3	Comfortable to get along with them, easy discussion and distribution (of tasks) of group work.
11	6	We trust each other, we believe that we can complete the work on time. Good chemistry (…) good team chemistry.
12	2	Have fun, really fun. This is the first time that we enjoy.
13	2	Everyone is flexible. It is easy to arrange the meeting. In other groups, some people may absent from the meeting, but in this group, everyone will present for the meeting, we are cooperative enough

Appendix I continued

15	1	I am great to have my group mates. They are quite cheerful. They don't stress even they have problem. They make everyone calm down and cheer everyone up.
17	1	Joyful and not so stress when doing the assignment.
18	4	Fruitful and enjoyable.
19	5	We have an entertainer. More fun when having the discussion.
20	1	Sometimes, we can have jokes or laughs, so it is not so serious.
21	3	I like the atmosphere of how the whole group discuss together.
22	3	How we interact is we already know each other so we feel comfortable to talk about our experience, so for me, our interaction is quite ok(lah) (*laughing*) because we are not very awkward at first.
Total = 19 groups	**Total quotations = 55** **Average = 2.89 quotations per group**	

Appendix J: Selected Quotations in Relation to Self-regulation, Co-regulation and Shared Regulation

Sources of data collection	**Selected Quotations: Second-level Codes**		
	Self-regulation	**Co-regulation**	**Shared regulation**
Observation	Sometimes if I can't understand something, I will read it first (*Participant A84, Group observation, dated: 27th October 2018*).	That means we got to mention the Early Harvest Program, and ASEAN-China free trade from the start/beginning, due to these two documents, then got (…) then causing (…) then causing the rest of the examples to happen (…) we have to review the trade agreement (*Participant A24, Group observation, dated: 5th October 2016*).	So, we search for the information first and decide when to meet again to combine (*Participant A33, Group observation, dated: 14th October 2016*).
Group interview	I think self-discipline, that you have the mind-set, motivation to do your work instead of not influence the mark of the group work then you will take the responsibility to do it and perform	For me, he always (…) almost every day, he shall ask me how is the progress of my study, he cares and observes whether you can do it or not (*Participant A80, Group interview, dated: 12th December 2018*).	Macroeconomics is a very big picture. If we do it individuals, we may not have a very great understanding, so in a group, we can contribute our parts (*Participant A72, Group interview, dated: 8th June 2018*).

Appendix J continued

	well (*Participant A5, Group interview, dated: 3rd May 2016*).		
Individual interview	I am sure if I took time to read every section, each and everyone's work but to be able to deliver something, listen (…) so for me it being (…) it being more than just an assignment, I have been learnt a lot (…) (*Participant A15, Individual interview, dated: 27th May 2016*).	I am the one who analysed the questions and told them what they do. They obey my instruction. They lack of opinions. They completed their parts and gave me (*Participant A51, Individual interview, dated: 10th November 2017*).	Especially for this economy assignment. We need to do a lot of collaboration and obtain help from the group members to complete their work. Doing it individually won't be able to ensure success for this unit (*Participant A63, Individual interview, dated: 2nd March 2018).*

Appendix K: Selected Quotations Related to Collaborative Problem-Solving in Groups

Selected Groups	Collaborative problem-solving	Problem-solving strategies		
		Division of labour	**Scaffolding**	**Peer learning**
19	Very helpful. When I meet some problem, they will help me to try to solve that (…) if we done by myself, when we stuck in a problem, we can't do anything, maybe we need someone to point out the points (*Participant A71, Group interview, dated: 8th June 2018*).	Since you guys work on part c, then let me work on part a) (*Participant A73, Group observation, dated: 20th April 2018*).	No, I just scare that I don't know what it's about (*Participant A74, Group observation, dated: 7th May 2018*). I think inside here, you got to mention you're using expansionary monetary policy and then explain it roughly how it affects the LM curve, and roughly how it affects the interest rate (*Participant A73, Group observation, dated: 7th May 2018*).	Can learn from each other too (*Participant A72, Group interview, dated: 8th June 2018*).
20	Maybe some of us may meet some problem in our parts, so meetup can help each other	Actually, we divide into two, like monetary policy part, me and A77 finishing it (*Participant*	Let me see how you draw your IS-LM model. Mine is different from yours (*Participant A75, Group observation, dated: 4th May 2018*).	

Appendix K continued

	(*Participant A78, Group interview, dated: 13th June 2018*).	*A75, Group Interview, dated: 13th June 2018*).	This is how I draw it (*Participant A78, Group observation, dated: 4th May 2018*).	
	(…) also help each other to solve the difficulty (*Participant A77, Group interview, dated: 13th June 2018*).	A78 and I focus on the household debts (*Participant A76, Group Interview, dated: 13th June 2018*).		Can learn from each other (…) (*Participant A77, Group interview, dated: 13th June 2018*).
22	Basically, everyone has their own responsibility to share the problem (*Participant A85, Group interview, dated: 3rd April 2019*).		I'm so confused *(Participant A85, Group observation, dated: 27th October 2018*). Maybe this is the factor that influences GDP growth. So, we have to explain it step by step. For example, why the manufacturing sector affects the growth of GDP? (*Participant A84, Group*	Because different person can have different knowledge on economics, right? If he can (…) How to say? A84 can teach me something on economics that I don't know then we can learn from each everyone (*Participant A85, Group interview, dated: 3rd April 2019*).

Appendix K continued

			observation, dated: 27th October 2018).	
	We figure out by ourselves. We find from the internet actually (…) and textbook maybe (*Participant A85, Group interview, dated: 3rd April 2019).*	Yes, we can divide the task, but we need to discuss all the questions first (*Participant A86, Group observation, dated: 27th October 2018*).	I learn the most information from A86 and A84. They (…) how to say (…) Before the meeting they research first and when the meeting, they tell me about what they know so save time as well, and they really give me a lot support for this assignment (*Participant A85, Group interview, dated: 3rd April 2019*).	(…) because each person has different knowledge, have different understanding, and then like collaborative learning, we learn together, we give knowledge for each other for information that we never know before (…) so it is really important because if we do the assignment alone, we cannot guarantee we can get the knowledge given by learning collaboratively (*Participant A85, Group interview, dated: 3rd April 2019*).

Appendix K continued

	Some we could solve it together (*Participant A84, Group interview, dated: 3rd April 2019*).	After we already know the requirement of question, we can divide the task and we can do it on our own, I think working like that is easier and more effective (*Participant A84, Observation, dated: 27th October 2018*).		

Appendix K continued

	From knowing the terminology, we are quite optimis(tic) that we could solve the question problem like that (…) we could do our best for that question (*Participant A84, Group interview, dated: 3rd April 2019*).			

Appendix L: Selected Quotations Related to Open Communication Coded in Group Observations

Group Number	Open communication	Selected quotations
1	Arguing	• You think that everyone is like you, you have a maid and cook for you.
	Denying	• I don't say that I don't want to add the recommendation.
	Expressing annoyance	• That one, how do I know?
2	Expressing worries	• I really worried, which one should I take?
	Expressing uncertainty	• In 2000, the current account balance got improvement, but I'm not sure whether there are other criterions.
4	Expressing frustration	• Tell you guys honestly, I really don't know how to move forward from here.
7	Disagreeing	• No, you're supposed to work on FDI and Silk Road. But you didn't do the Silk Road.
17	Defending	• It is a recession time, if not selling it at this point of time, when do you want to sell it?
	Expressing confusion	• It's very confusing. Here you state firms retrench the workers, and then on another hand, you state firms recruit workers.
21	Expressing surprise	• Real one? All these graphs are the real ones?
	Expressing excitement	• Suddenly, I feel that economics is fun.
	Expressing curiosity	• I also curious what is the use for this. There are nine tables enclosed.

Appendix M: Selected Quotations of Cognitive Dissonance

Group	Participants	Selected quotations of group observations:	Researcher's interpretation on incidents related to cognitive dissonance happened in group observations:	Selected quotations of group interviews related to knowledge-building:
Group 1, Date of observation: 20th April 2016				*12th May 2016*
1	A2:	What I observe is at the beginning phase of GST implementation, it may not be good, but in the long term, it may stimulate the economy. Not really mean that it is good at the initial stage of implementation, it is in the long term that it may stimulate the economy.	Participant A1 has a different perspective on implementing the GST, and its impacts on the personal lifestyle. Both A2 and A3 stood on the same ground and opined that GST is beneficial in the long term based on the revenue collected. However, participant A1 viewed that both her group members' perspectives was contradicted with her existing	Listen to others and get to know more about the topic. Since our topic is related in our learning subject, throughout the group work and discussion, I can understand more about the topics and some which not even taught in this subject.

Appendix M continued

			beliefs that the revenue from GST was supposed belonging to the people, and should not be channelled to the government. Outcome: Despite their perspectives differing on the implementation of GST, group members acknowledged that their understanding of the issues was improved in their group interview.	
	A3:	If the government does not have enough revenue, then we can cover it using GST, once the government got the revenue, then -		I like the feeling of learning with fun while doing my work. Quite democratic.

Appendix M continued

	A1:	(overlapping) Our money is gone like this.		(…) last time you just think GST, ahh (…) just paylah, I cannot do anything about it, you don't really bother how it is used and what items they tax you and what they don't, so now I actually know more, so now when I go to buy things, I think properly.
	A3:	Don't spend on unnecessary items like MacBook. You don't have to purchase such a good quality item. But they are branded, how are they different? You have to stand from the perspective for those who have the financial constraint, it is impossible that they will be able to buy Macbook from the Apple (store).		

Appendix M continued

Group 7, Date of observation: 5th October 2016				*28th October 2016*
7	A26:	Why for the cons, there is a statement that it (the trade) will cause destruction of native culture?	Both participants A26 and A24 have different perspectives on the free trade. A26 questioned A24 on her comment on how trades could cause destruction for Malaysia. A26 viewed that A24's perspectives on free trades were conflicted with her existing beliefs that trades develop the local economy since Malaysia has plenty of resources to be explored.	
	A24:	Because we feel that foreign companies establish their companies in Malaysia, so they may exploit natural resources locally.		
	A26:	But they develop the local economy is good.		

Appendix M continued

	A24:	We want to manipulate this statement and twist it as a disadvantage.	Outcome: Despite their perspectives on free trade, A24 stated that her understanding of this issue improved; and A26 focused on sharing knowledge and reiterated her stand on the importance of free trade in their group interview.	Discussion for every point; find examples and evidence. I understand more about the impacts of the free trade agreement.
	A26:	We got a lot of forest not yet developed (…) if they were here to assist with the development.		We shared the knowledge about the Malaysia-China free trade, pros and cons, Malaysia and China free trade actually started many years ago. Anything specific, for sure, benefits to Malaysia bring out benefits, trade internationally, China is the main economy leading country.

Appendix N: Selected Quotations of Assessing the Prior and/or Current State of Knowledge Gaps

Group No, Date of Interview	**Participants**	**Contemporary economic issues**	**Prior knowledge**	**Improvement of understanding or knowledge versus coping strategies**
Group 6, 20th May 2016	A19	Money laundering	Hmmm (...), actually I heard about the "dirty money" when I am still young then still small(lah), I heard from my grandparents and my parents. But at that time, I don't know what is the picture about it (…)	When I am doing my part, because we need to doing the research, found more information about the theory and then somehow, I just know that the money laundering can link to the terrorism that the money laundering can link to the terrorism financing and globalisation issues through conclusion of my part (*Improvement of understanding*). (*Strategy: Distributed expertise caused by distributed job allocation*)
	A21		Because last time when I study article also one and newspaper as well, I don't understand how those people they can determine GDP going up and going	(…) but at least when do this research, we can know that actually what is real cause that is happening in the country, in other country that caused everything to happen. And maybe not only money laundering but as we research, we found

Appendix N continued

			down. My mind is just like how can you know what is the percentage [for GDP]	out other information about this (*Improvement of understanding*). (*Strategy: Information searching: evidence-based information)*
	A22		Like A20 just now she said that, at first, we… I also think that the money laundering will only affect a country but not the whole world of the international.	But through this project, I actually found that it will not only affect the country's economy but maybe will affect the income distribution and also even reduce the annual GDP of the country, but will also affect like the interest rate, exchange rate around the world, bring much impact of the economic aspects (*Improvement of understanding*). (*Strategies: Authentic assessment; and information searching: evidence-based information*)
	A20		Before that, I thought money laundering is just internal, you know – just effects the country	After study, I know that there is an interrelationship between countries and in fact it

Appendix N continued

				will not only effect one country's economy but the whole world (*Improvement of understanding*) (*Strategy: Information searching: evidence-based information*)
Group 10, 15th November 2016	A35	Global financial crisis	Is like before I started this…the research on the CDO, I thought CDO, I only know CDO is a pool of loans and I just like "oh is just a pool of loans", and I don't know why are they doing this, ... they are going to sell it like financial instrument.	Is actually the (…) is actually the questions. When they asked the questions like (…) the team members especially on A37, she is like very curious on it. She asks "how is the CDO works?" and when I found it "I can't really explaining it in the first meeting" that (…) that like turning point of it, that is why I feel like want to deep into it (…) want to explain it in a better way at that time (…) I always feel like want to (…) want to get people (…) want to answer people when people ask me questions so (…) when they start asking, I would like to make it better to answer. This topic is mostly helping me to understand the CDO actually, the function of CDO and also the

Appendix N continued

				impacts of lead(ing) to GFC (*Improvement of understanding*). (*Strategies: Acknowledge questioning from group member to trigger her to go into in-depth research. Discourse strategies: questioning and explaining; and information searching: evidence-based information*).
	A36		Before I started this assignment, I have no knowledge at all on how does a CDO actually works and I didn't know that subprime debts can actually lead to so many serious problems.	(…) for me I think A35 did the most work actually design our slides for us and then she, her slides, ya I think she did (…) she contributed the mostlah and she explained to us what is CDO, securitisation and that is (…) her part is the most important part that is if we don't know what is CDO, we cannot do, we cannot continue our part so after she has explained to us, I actually did gain a lot from her (*Improvement of understanding*) Because everything is linked to CDO, securitisation, and it links to the impacts and so on so on so we actually research on basically

Appendix N continued

				everything… because everything links (with each other). (*Strategies: Discourse strategy: explaining, peer learning; and information searching: evidence-based information*).
	A37		At the first, I don't understand how (…) what is CDO? And what is the securitisation? And but after that they (…). I read articles but still don't understand, they explained to me, ya, so I can understand the how (…) what is the CDO actually and also what is subprime.	Actually, is because I read those articles for myself, I don't really understand the meaning so by discussion at least I just keep on asking them the definitions on those things, want to see I understand wrong or right for the issues. I understand what is CDO, and the next one is I understand securitisation, and another one is global financial crisis, actually, after the assignment, I actually understand what this word means, what is their definition, what is its insights, and what is it, and how it works (…), how it impacts other things, other factors as well.

Appendix N continued

				Maybe other countries' economy and ya, and maybe when they (…), when they (…), the borrowers cannot pay their debts, so it will affect the banks as well and those investors who buy the CDO (…), so they will affect the other parties (*Improvement of understanding*) (*Strategies: Discourse strategy: explaining and asking questions, and peer learning*).
	A38		Maybe at the beginning, we are not really clear on the topics for the impacts or the lessons from the global financial crisis … Because at first maybe we don't know what is the exact reason that causes the global financial crisis.	I not clear CDO at first so since this is a group work, my group mates will explain to me but I do it individually, maybe no one will explain to me. After we do research and after presentation, after submitting the report, we get more knowledge on economics related to global financial crisis. (*From improvement of understanding to knowledge*)

Appendix N continued

				(*Strategies: Discourse strategy: explaining, peer learning, and information searching: evidence-based information*).
Group 20, 13th June 2018	A75	Great Recession Imprudent lending activities	At first, I thought that the bank (…) what is that again? The central bank of US, the Federal Reserve will print more money, and after that I found out that actually they didn't print the money. The Federal Reserve put in more money in the economy so that people can spend more, and to increase the circulation, more like in a cycle.	The graph. No matter how I draw, I still got it wrong. A78 helped us to draw the graph, LM (liquidity-preference money supply) curve. Like we know our country's current economic situation, if government needs money, they will sell bonds to us, so we have to invest it to earn money. (*Improvement of understanding*). (*Strategy: Peer learning*)
	A77		Like for the monetary policy, at first, we only know it very generally	About the graph. Because I'm not very sure about that and I asked about it that how the (interest) rate didn't go to negative (…) but now we know the tools of monetary policy like open market operation, discount rate and reserve requirement

Appendix N continued

				(*Improvement of understanding).* (*Strategies: Peer learning, and discourse strategy: asking questions*)
	A78		At the beginning, we keep reading the article, and we actually don't know what is the Great Recession mean.	The USA is an open economy and then the recession right actually affects the things like the exchange rate and influence the world for exports and imports (*Improvement of understanding*). (*Strategy: Information searching: evidence-based information*).
	A76		Like the imprudent lending activities. At first, we thought we need to look for the people's point of view but actually we need to look from bank's perspectives.	A78 helped me, like just reading through the internet (resources) is actually I couldn't really understand what it is talking. She did explain to me. Mainly on the imprudent lending activities. Great recession affecting the world. Because USA is actually a leading country. Like even the strong country can't do better, how can we expect the weak country to perform (*Improvement of understanding*).

Appendix N continued

				(*Strategies*: *Discourse strategy: explaining and peer learning*).

Appendix O: Advancement in Knowledge

Group Number	Participant ID	ATLAS.ti Quotation Content: Group Interview	Strategies
2	A5	I am lacking finding research on other countries, through this, I learn more as more knowledge on what is happening outside (*dated: 3rd May 2016*).	Information searching: evidence-based information
3	A8	I think when we are doing it in a group work other than besides the individual tasks, we actually help each other to gain more knowledge, for example any current examples like I never know that when a country is bankrupted then we actually invested in bitcoins, you still can keep the value of the bitcoins itself (*dated: 6th May 2016*).	Peer learning, scaffolding
	A10	Then the second is we have some discussion that enhances the knowledge (*dated: 6th May 2016*).	Group discussion
7	A24	As assignments of economics required statistics as evidence so by reading the statistics, I gain knowledge of country's economy. Statistics such as the labour statistics, the tax revenue collects by the government, the FDI (foreign direct investment) of China in Malaysia (*dated: 28th October 2016*).	Information searching: evidence-based information

Appendix O continued

	A25	The searching on this topic improves our knowledge to understand deeperly in the topic (…) The topics are free trade, benefits and limitations of free trade. Malaysia also have contract with other countries such as China, Singapore and Indonesia; the domestic resources are exported to other countries (*dated: 28th October 2016*).	Information searching: evidence-based information
10	A38	After we do research and after presentation, after submitting the report, we get more knowledge on economics related to global financial crisis. Because at first maybe we don't know what is the exact reason that causes the global financial crisis (*dated: 15th November 2016*).	Information searching: evidence-based information
	A37	I think (…) my part I think not really like contribute to this group I think from what I think because my part is just like doing the conclusion and the (…) but I actually gain a lot of knowledge from them, from my group mates (*dated: 15th November 2016*).	Peer learning
	A38	Because we concentrate on one part so we will do more research on that part so it will increase our knowledge (*dated: 15th November 2016*).	Distributed expertise

Appendix O continued

	A38	Group work can improve our knowledge in economics because like everyone researches on (…) do more research on each part so at the end group mates can (…) can share to us what they (…) what they got from their research so that we got more knowledge from their parts (*dated: 15th November 2016*).	Group work
11	A40	I think that researching on this topic has helped me to improve my knowledge on economics because before I did not know anything about Islamic banking and now, I know a lot what is Islamic banking, the growth, the pros and cons and the main purpose of the Islamic banking (*dated: 15th November 2016*).	Information searching: evidence-based information
	A40	The knowledge and ideas of my group mates improved my knowledge on economics. Because there might be some points that I would not pay attention on, but my group mates would, so this contributes to my knowledge-building a lot (*dated: 15th November 2016*).	Peer learning

Appendix O continued

	A40	Meeting has helped me to improve my knowledge as the sharing of information helped to focus on some parts deeply so each of us was focusing on a particular part of the topic, so later (…) when we combine our findings, it provided more clear and full knowledge about Islamic banking (*dated: 15th November 2016*).	Group discussion
	A40	Sharing the responsibilities promotes the deeper research and allows to focus more on particular parts of the topic, then when we meet, we can share our knowledge and help each other to learn more about the topic (*dated: 15th November 2016*).	Distributed expertise
22	A86	Improve our knowledge that we don't know, but through this discussion we know some weaknesses (dated: 3rd April 2019)	Group discussion
	A84	And when we doing group assignment, I think we research much more than doing it by ourselves, I mean if only individually doing for the assignment, then we would do some research not as much as group research, so from that we could gain much more knowledge (*dated: 3rd April 2019*).	Group work

Appendix P: Enhanced Proficiency in Relating Knowledge to Contemporary Economic Issues.

Group Number, date of group interview	**Group Member**	**Selected Quotations**	**Connectivity**
Group 6, 20th May 2016	A19	When I am doing my part, because we need to doing the research, found more information about the theory and then somehow, I just know that the money laundering can *link* to the terrorism financing and globalisation issues through conclusion of my part.	Link money laundering to terrorism financing and globalisation issues.
	A22	But through this project, I actually found that it (money laundering) *will not only* affect the country's economy but maybe will affect the income distribution and also even reduce the annual GDP of the country, but will also affect like the interest rate, exchange rate around the world, bring much impact of the economic aspects.	Link money laundering with macroeconomic variables.

Appendix P continued

Group 10, 15th November 2016	A37	The economic is *linked* to the whole world. I have some ideas (…) is like *link* to the world when one country like US's economics collapsed, it actually affects other countries as well.	Chain effect of US global financial crisis to the world as a whole.
Group 4, 19th May 2016	A14	I know how the debt crisis in Greece affects the world (…) not only just Europe countries. Affect the bond price, share price of other countries, stock index in other countries like Latin America and America. After the presentation, I can *link* all of the parts together.	Implications of Greece's debt crisis on macroeconomic variables and the world as the whole.
Group 8, 16th November 2016	A28	I learn more about SWF and how it influences the world, and I read how it will relate to a lot of categories of macroeconomics and how it will impact like for example the country and their politics everything, how it all come in and how all those things will affect one big fund, how the fund will be created and then how the misuse of the general public towards the fund and everything and actually the fund still *link* to have connection between countries.	Implications of SWF with macroeconomics environment.
	A27	Actually, there is something that I have been looking as well, stock (…) stock exchange movement, so when you look at certain companies and their stocks, you tend to see who are the particular shareholders, or I have been quite	Connect SWF with stock prices and investment opportunities.

Appendix P continued

		interested in Temasek Holdings which is one of the sovereign wealth funds of Singapore, so I have been kind like *tracking* like what particular things or investment opportunities is to be looking into, ah (…) that's basically ya.	
Group 19, 8th June 2018	A73	Before that, I don't know that all industries are always *related* to each other. Like one industry that something had happened and is related to other industries. Like the recession, the first affected is the construction … construction site, and then it is related to supplies of materials, and the supplying of materials is related to other.	Chain effect of recession to supply chain industries.

Legend: Terminology in italics denotes as establishing connectivity and relationship between two elements

Appendix Q: Enhanced Capability to Link Contemporary Economic Issues with Prospects

Group Number, date of group /individual interview	**Group Member**	**Selected Quotations**	**Application of knowledge to–future prospects**
Group 20, 13th June 2018	A75	Because I think for ordinary people would think property would earn money, right? So, after doing this assignment, we (…) we know that actually there is a housing bubble, we keep on thinking buying more properties better, can earn more in the *future*, actually, if we keep on buying the properties, to one limit, then if the bubble bursts, all the properties price will be no value, so even though rich but don't buy too much properties, how to say ya? It will cause harm on others. The gap between the poor and the rich will be bigger and larger (wider). *Issue: Housing bubbles*	Application of knowledge to the future prospect by connecting the buying behaviour on houses with the wealth inequality between rich and poor. Application of knowledge to a macroeconomic issue.

Appendix Q continued

Group 14, 10th November 2017	A51	I also realise that the economy will go over and over it again. Maybe this year is in recession, but maybe in growth, it is like a business cycle, it will go over and over again, it won't stop at one point. Maybe it will be more useful if I join a company in the *future* for working purpose. *Issue: Business cycle*	Application of knowledge to the future prospect by connecting knowledge on business cycles with future career. Application of knowledge to a microeconomic issue.
Group 21, 12th December 2018	A83	Understand how the economists assess the economics information so in the *future* we can (…) if there is any relation to it in our jobs until we know how to apply it. *Issue: Macroeconomic variables*	Application of economic knowledge to future career. Application of knowledge to a microeconomic issue.
Group 22, 3rd April 2019	A84	Maybe I could apply the knowledge in my career by knowing the impacts of the economy to the company that I will be working with *next time*. In the finance field on related information such as securities investment. *Issue: Business cycle*	Application of economic knowledge particularly on transferring the knowledge to other discipline such as finance in the future career. Application of knowledge to a microeconomic issue.

Appendix Q continued

	A85	Knowledge in our economy, is also helping us for the future because we will do (…) how to say (...) we will do investment in the economy (…) how to invest our money in the *future* maybe (...) so from this knowledge that (…) I think is really helpful even for the future as well. *Issue: Potential market growth*	Application of knowledge to the future prospect by projecting future investment opportunities. Application of knowledge to both macroeconomic and microeconomic issues.
Group 3, 6th May 2016	A10	We are quite positive with bitcoins actually ya (...) they will (…) We think that maybe in the *future,* it can be regulated, then we (…) it will be applied because on…in the research, we found that the countries are quite positive about bitcoins. *Issue: Decentralised digital currency*	Application of knowledge to the future prospect by projecting the potential growth of bitcoins in the future. Application of knowledge to a macroeconomic issue.
Group 8, 16th November 2016	A42	(SWF) from the macroeconomics perspective, the entire market and the microeconomics perspective because the foreign exchange starts fluctuating then businesses costs was and demand move around as well (…) so just the fact that they are the major economic power, it can become	Application of knowledge to the future prospect by projecting the accelerating effects of SWF in the future.

Appendix Q continued

		increasing important issue because they are basically cumulating more wealth soon, if it is a small problem now, definitely it will a huge problem in 10 to 5 years, 5 to 10 years' time because they just getting more economic power and (…) so that it is. *Issue: Sovereign Wealth Fund*	Application of knowledge to a macroeconomic issue. Application of knowledge to the future prospect by projecting the accelerating effects of SWF in the future. Application of knowledge to a macroeconomic issue.
Group 15, 10th November 2017	A57	I more understand how serious is the unemployment rate in Malaysia. Just like you are highly educated, you are not sure whether you can get job or not in the *future*; I know what are the government policies to decrease the unemployment rate to solve the problem. I remember in 2010, because of financial crisis in 2008, the unemployment rate is high, the government and the fiscal policy injects few billion to solve the unemployment problem. *Issue: Unemployment problem*	Application of knowledge to the future prospect by projecting the future unemployment rate and employment opportunities in the future. Application of knowledge to both macroeconomic and microeconomic issues.

Legend: Terminology in italics denotes as establishing connectivity and relationship between two elements

Appendix R: Change of Perspective among Participants

Group Number	**Group Member**	**Selected Quotations**	**Implication: Change of perspective**
Group 1	A1	I learned about GST. Frankly speaking, GST burdens the people. Learning more about GST allows me to be more conservative about spending. Applying it into daily routines such as getting meals. Should u eat out, u are to pay the 6% GST. However, if u buy ingredients and cook it at home, u would not need to pay GST as most cooking items are zero-rated items. (*Follow up interview, dated: 2nd July 2017*)	Social: Personal life style on consumption pattern
Group 20	A78	One factor causing the Great Recession is housing bubble (,,,) think twice(lah) before we decide to buying a good house. Because the people think the price of housing is rising, so they buy the house to gain (…) to get (…) to earn money. Actually, it's very dangerous (as she mentioned housing bubble earlier on). (*Focus group interview, dated: 13th June 2018*)	Social: Personal life style on consumption pattern

Appendix R continued

Group 12	A43	I think it helps me to be a more ethic person, ah (…), I think in the future, I will be an auditor, if not an accountant, so it is very important to have integrity in handling all of these things, accounts to be specific. So, in money laundering, we study that the consequences of it, so I think it will help me (…) to remind me that "Not to do it in the future." (*Follow up interview, dated: 12th June 2017*)	Ethics
Group 14	A51	Previously, I don't care the politics. I rarely go to search for news. After I done the report, I realise that government is having an important role in economy growth of a country. As a responsible resident, we need to concern of the economy, we need to read more news and not Facebook. Most of my friends read Facebook, and think that they are reading news, but they are not the real ones. I decide to go for voting. Because like what I say, everyone needs to carry out our obligation, everyone has the same concern then things will work, we can influence our friends to do the same thing that is to go for voting, and not complaining. (*Individual interview, dated:10th November 2017*)	Politics

Appendix R continued

Group 16	A64	I am very interested on how the government creates the policy and people react to it. You can exactly forecast how people react to it, so I found it very interesting. Like for Brexit in England in 2016 on a referendum that causes a drop in economy, how the government reacts to the drop in the economy, and how people react to it. (*Individual interview, dated: 4th December 2017*)	Economy
Group 3	A8	So, after I learn that in any single business structure, there will be pros and cons. So (…) after I do more research, I know there are world largest black market trading, there is money laundering and there is crimes so there are a lot of bad things happening for the creation of bitcoins itself so it may not be a good idea but perhaps (…) perhaps with some regulations by the government or the banks, it may serve the better purpose. (*Group interview, dated: 6th May 2016*)	Economy

Appendix R continued

Group 15	A58	I actually understand more how GDP works with other macro variables like exchange rate, unemployment rate and interest rate. I actually know these variables affect the growth of the economy. It is very challenging because in Malaysia, most students in Malaysia not really passionate in economy (..). because people found that the economy is quite boring, they have (…) what to say (…) they have the kind of thinking that studying economics is difficult. (*Group interview, dated: 10th Nov 2017*)	Behavioural economics: Learning interest
Group 19	A73	In this study, most probably is that everything that is happening in the world is always related to economics. Because I always very interested in learning economics, because I think that is the only thing that I can apply in the real world and all the equations and graphs are all very interesting. (*Group interview, dated: 8th June 2018*)	Behavioural economics: Learning interest
Group 16	A61	Learn to read on other people's analysis. Other people mean the professional people's analysis. I mean when you read the business report, you know what the professional people want to convey, if you are a layman, you are most probably don't understand the scope of analysis from the economy. (*Group interview, dated: 2nd March 2018*)	Behavioural economics: Analytical skill