Exploring Collaborative Learning in the Middle Years Programme from the International Baccalaureate Organization through Network and Content Analysis

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ABSTRACT

Collaborative learning is important for student success in science classrooms. This study used content and network analysis to assess how collaborative learning skills in Middle Years Programme (MYP) science classrooms are supported. Nine curricula documents were selected for content analysis and were examined for phrases related to a priori or emergent codes. Categories establishing trends within each code were named; similar categories across codes were merged into themes. Nine themes were found, related to student behavior and cognition, educator behavior and classroom environment, and learning goals. Network analysis was used to graphically explore the social structures interconnecting codes. This information can be used to examine what is implemented in classrooms as well as provide some guidance for the refinement of existing curricula.

INTRODUCTION

Background

Socially Shared Regulated Learning (Carpenter & Pease, 2013; Hadwin & Oshige, 2011; Shear et al., 2010; Rogat & Linnenbrink-Garcia, 2011)

- ➢ Important for student success
  - ➢ Fosters learning regulation through decision-making, communication, reflection, and other group interactions
  - ➢ Fosters understanding and motivation

Role of the Teacher (Gijlers & De Jong, 2005; Zincola, 2008)

- ➢ Contributes to student collaboration through composing groups, fostering engagement, modeling collaboration, and other tangible and intangible factors

Student Roles and Engagement (Eilks, 2005; Gomez-Lanier, 2018; Jeon, Huffman, & Noh, 2005; Rozenszayn & Assaraf, 2011; Winters & Alexander, 2011)

- ➢ Cognitively, emotionally, agentically, and behaviorally engaging in collaborative academic tasks increases regulation and achievement

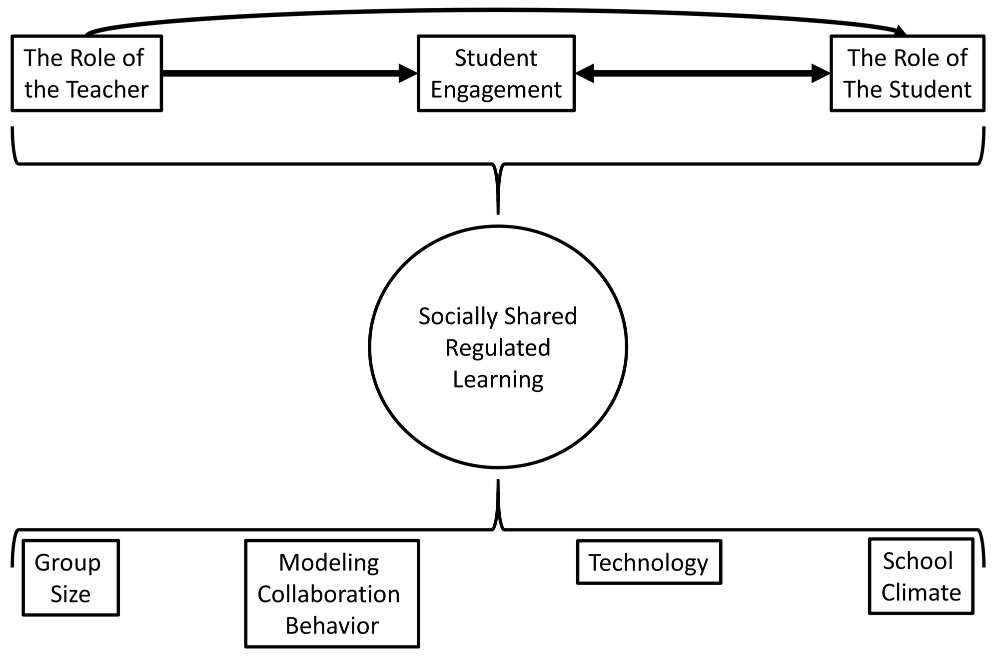
Purpose

- ➢ To observe if themes evident in MYP curriculum documents regarding collaborative learning in science classrooms reflect themes present in the literature through content analysis
- ➢ To examine if our proposed model accurately reflects how collaborative learning in MYP science classrooms in characterized through network analysis

THEORETICAL MODEL

Figure 1

Project Model



METHODS

Data Sources

- ➢ Nine documents (n = 9) from the MYP were chosen for content analysis due to their relationship to collaborative learning in MYP science classrooms. Examples of these documents include the *MYP: From Principles into Practice*, *Teaching the disciplines in the MYP: Nurturing Big Ideas and Deep Understanding*, and *Fostering Interdisciplinary Teaching and Learning in the MYP*.

Data Analysis Procedures

Content analysis (Vaismoradi et al., 2013, 2016)

- ➢ **Background**
  - ➢ Uses both inductive and deductive techniques to examine manifest and latent content to establish emergent themes from the documents
- ➢ **Method**
  - ➢ Examined documents for phrases related to a priori or emergent codes
  - ➢ Recorded excerpt summaries and interpretations
  - ➢ Code frequencies noted:
    - ➢ Within documents
    - ➢ Across documents
  - ➢ Code sheets assembled, containing
    - ➢ Name of the code
    - ➢ Total frequency
    - ➢ Frequency in each document
    - ➢ Categories observed within each code
    - ➢ Example quotes were for each category
  - ➢ Common categories were merged into themes
  - ➢ Themes were provided with definitions and listed alongside their associated codes and quotes

Network Analysis (Dado & Bodemer, 2017; Kashyap & Saritha, 2018)

- ➢ Used to demonstrate connections between codes across curriculum documents
- ➢ Allowed for the visual exploration of social structures
- ➢ Created the network model, coded pairs which overlapped, and put into a network modeling software, UCInet (Borgatti, Everett, & Freeman, 1999)

RESULTS

Content Analysis

- ➢ 22 codes were a priori (12 parent, 10 child), and 3 codes were emergent (all codes are listed in Figure 2)

Themes

- ➢ Critical reflection and action
  - ➢ The ways in which the Middle Years Program encourages students to look at the thoughts, perspectives, and actions of themselves and others during collaborative learning in science classrooms for the sake of learning and growth
- ➢ Educator regulation of the learning environment
  - ➢ The role of educators during collaborative learning in science classrooms to support the regulation of student work
- ➢ Holistic student growth
  - ➢ The ways in which the Middle Years Program supports student cognitive, emotional, physical, and social growth during collaborative learning in science classrooms
- ➢ Inquiry
  - ➢ The ways in which the Middle Years Program fosters the students with the skills to ask and investigate their questions about the world during collaborative learning in science classrooms
- ➢ Interdisciplinary learning environments
  - ➢ Allow students to engage in collaborative activities and asking questions that do not only take place across contexts, but also involve generalizable skills and are applicable in different situations
- ➢ Real-world knowledge application across contexts and outside the classroom
  - ➢ The ways in which the Middle Years Program enables students to generalize the skills obtained in the classroom during collaborative learning in science classrooms
- ➢ Respectful communication
  - ➢ The ways in which the Middle Years Program fosters students actively, inclusively, and considerately listening and speaking with others during collaborative learning in science classrooms
- ➢ Responsibility
  - ➢ The ways in which the Middle Years Program fosters student's owning their actions and portions of the task at hand during collaborative learning in science classrooms
- ➢ Social-emotional learning
  - ➢ The ways in which the Middle Years Program fosters student growth in social ways as well as their emotional abilities during collaborative learning in science classrooms

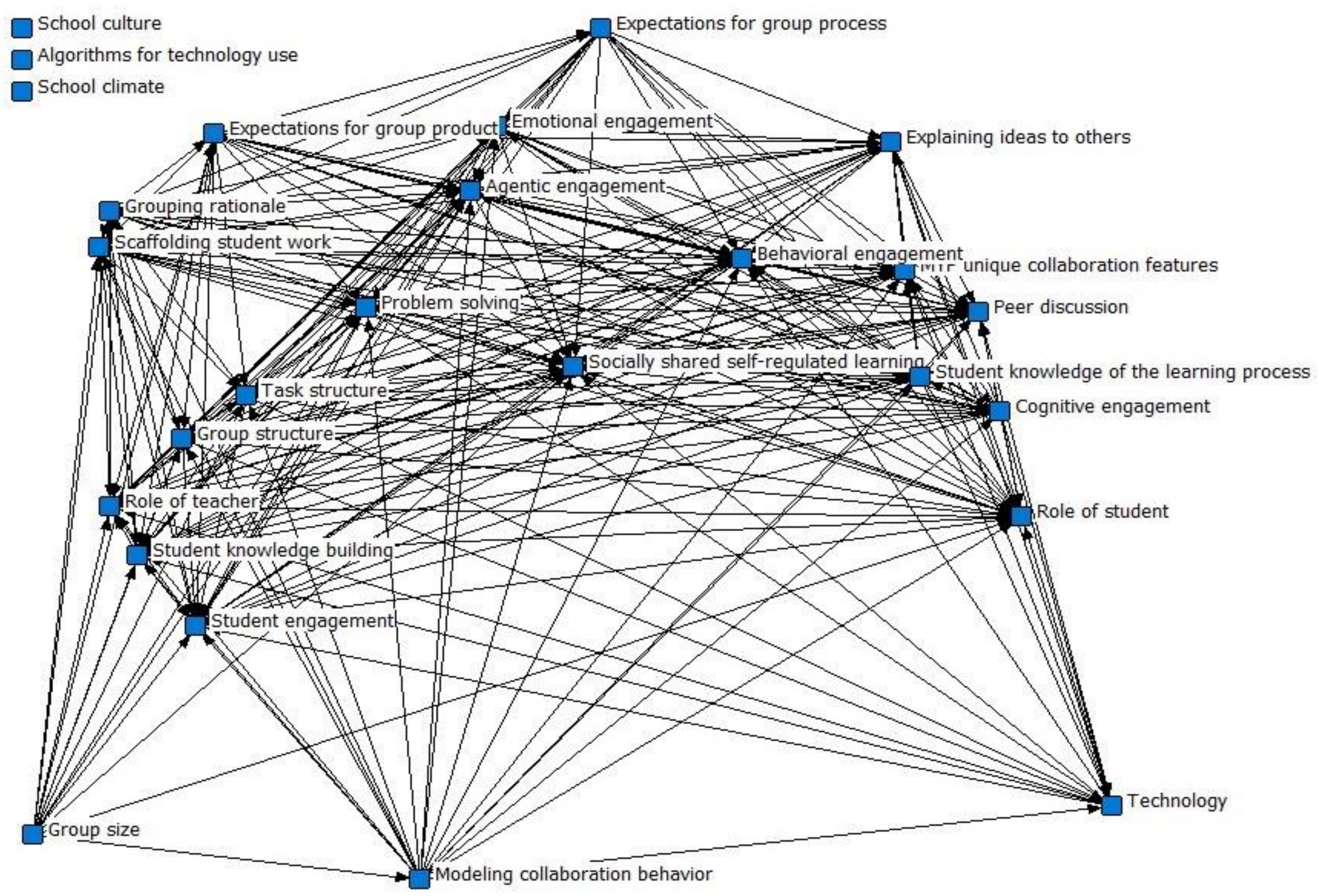
RESULTS

Network Analysis

- ➢ Centrality
  - ➢ Socially shared self-regulated learning was the most connected code to other codes
- ➢ Connections
  - ➢ Task Structure, Group Structure, Role of Teacher, Student Knowledge Building, and Student Engagement are clustered on the left, representing an overarching concept of Student Groups for Building Knowledge
- ➢ Distance
  - ➢ Grouping Rationale and Scaffolding Student work were closely related

Figure 2

Network Model



DISCUSSION

Findings

- ➢ The codes and subsequent themes observed in content analysis of MYP documents are aligned with constructs and concepts present in the pre-existing body of literature regarding collaborative learning in science classrooms.
- ➢ Our proposed model generally fits collaborative learning in the MYP curriculum as observed through network analysis.

Implications for Practice and Future Research

- ➢ The role of the student is still unclear relative to the MYP curriculum; studies going forward can solidify the composition of the student role.
- ➢ School culture and climate did not emerge as important variables of collaborative learning in the network model. More research is needed to understand how school climate and culture operate in collaborative learning environments.
- ➢ As expected, Group Size, Modelling Collaboration Behaviors, and Technology were shown to be the foundation of collaborative learning in our network model.

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