



McGill University

# Teaching Mathematics Through Financial Contexts: Are Teachers Comfortable With Teaching Concepts?

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## Introduction

The importance of financial literacy education (FLE) has been increasingly recognized among different scholars and institutions (Arthur, 2012; OECD, 2013). Research shows that teachers can use FL to address this issue by helping students think critically about their decisions and how they impact their communities (Arthur, 2012; Lusardi, 2014). As a result, several countries including Canada have revised and incorporated FLE in their courses including Mathematics.

However, the latest PISA revealed that schools are not properly tackling such concepts in class (OECD, 2017). Such results suggest that teachers must be better prepared to support their pupils in schools and to provide them with meaningful experiences to discuss financial matters and their impact on students' lives and communities.

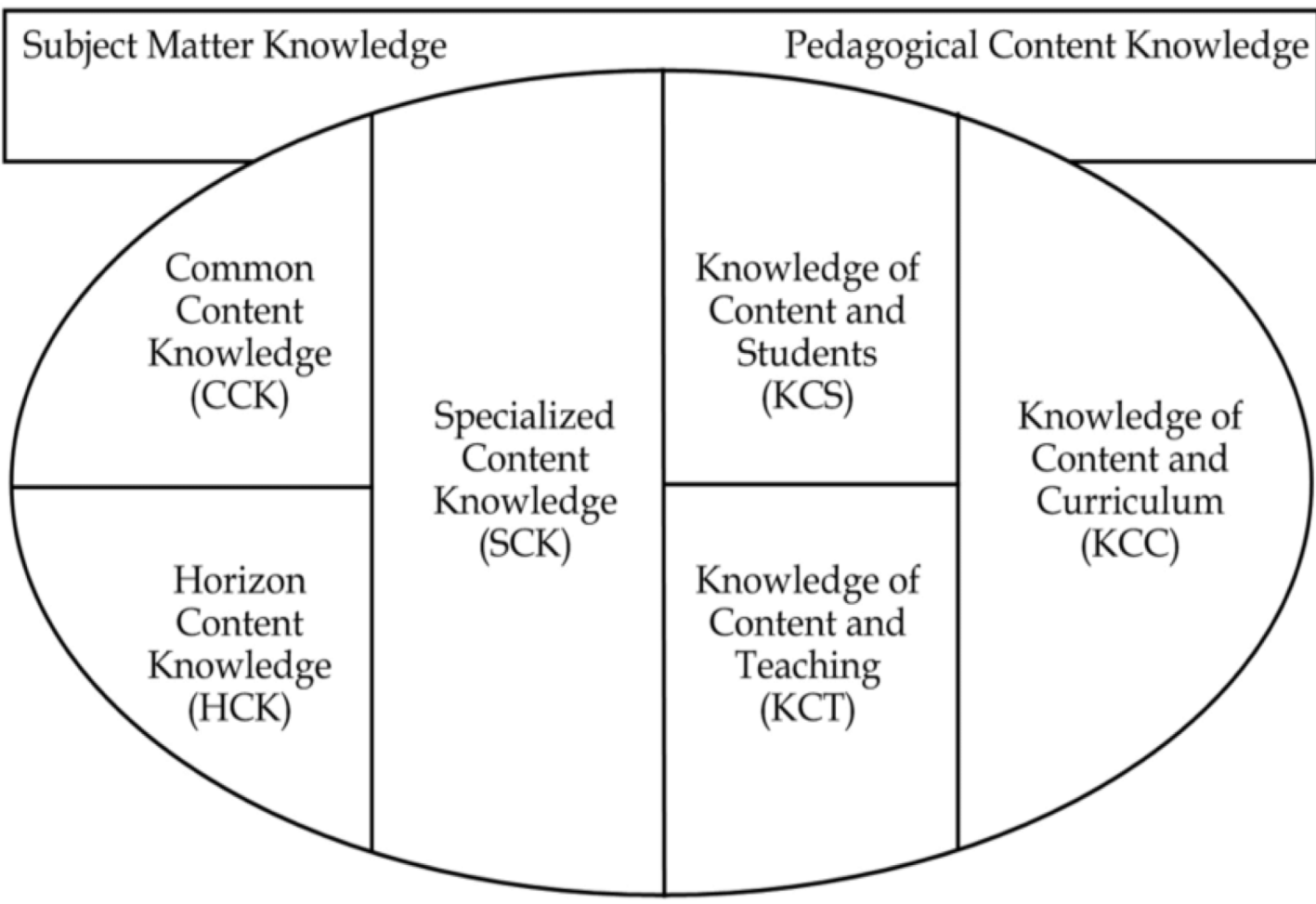
In Québec, FLE must be taught through the Broad Areas of Learning. Since 2016, it also appears explicitly in the secondary mathematics curriculum (Quebec Ministry of Education, Sports and Leisure, nd). However, teacher education programs in Quebec do not provide the necessary instruction with this regard. Also, preliminary data shows that this gap between their preparation and what is expected from them makes teachers feel they cannot teach financial literacy.

Consequently, to support them in teaching the subject, it is important that we first understand the current context of teachers who are implementing the new program. In this research, we aim to investigate what the teachers are doing and what their needs are.

## Theoretical Framework

In this project, we adopt the OECD's definition of financial literacy (FL), which refers to "knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life" (OECD, 2017, p. 50).

Our focus is to understand the knowledge that secondary mathematics teachers currently have with regards to FL. Therefore we utilize Ball et al's (2008) conceptualization of teacher knowledge. In this presentation, our focus relies on the teacher's Specialized Content Knowledge (SCK). In other words, we describe the financial concepts with which teachers feel comfortable, and the mathematical content associated with such concepts.



## Objectives

This presentation draws on a larger ongoing project funded by Quebec's *Autorité des Marchés Financiers* (AMF). The objectives of this research are to identify and assess the needs of secondary mathematics teachers who teach financial literacy education. We investigate what they do in terms of financial education and what their needs are within their discipline.

More specifically we aim to:

- Identify how teachers teach mathematics through financial concepts
- Recognize what teachers' needs to support their teaching in terms of financial education
- Identify teachers' needs to support their teaching in terms of content and pedagogy for future teacher training and curriculum development.

## Methods

We conducted a qualitative research with 36 secondary mathematics teachers from different regions of Québec, Canada. The research methods consisted of an online survey (14 questions and sub questions about their experience and perceptions of financial concepts and mathematics), 6 focus groups about their needs and current practices, and 4 classroom observations of a lesson touching on financial concepts.

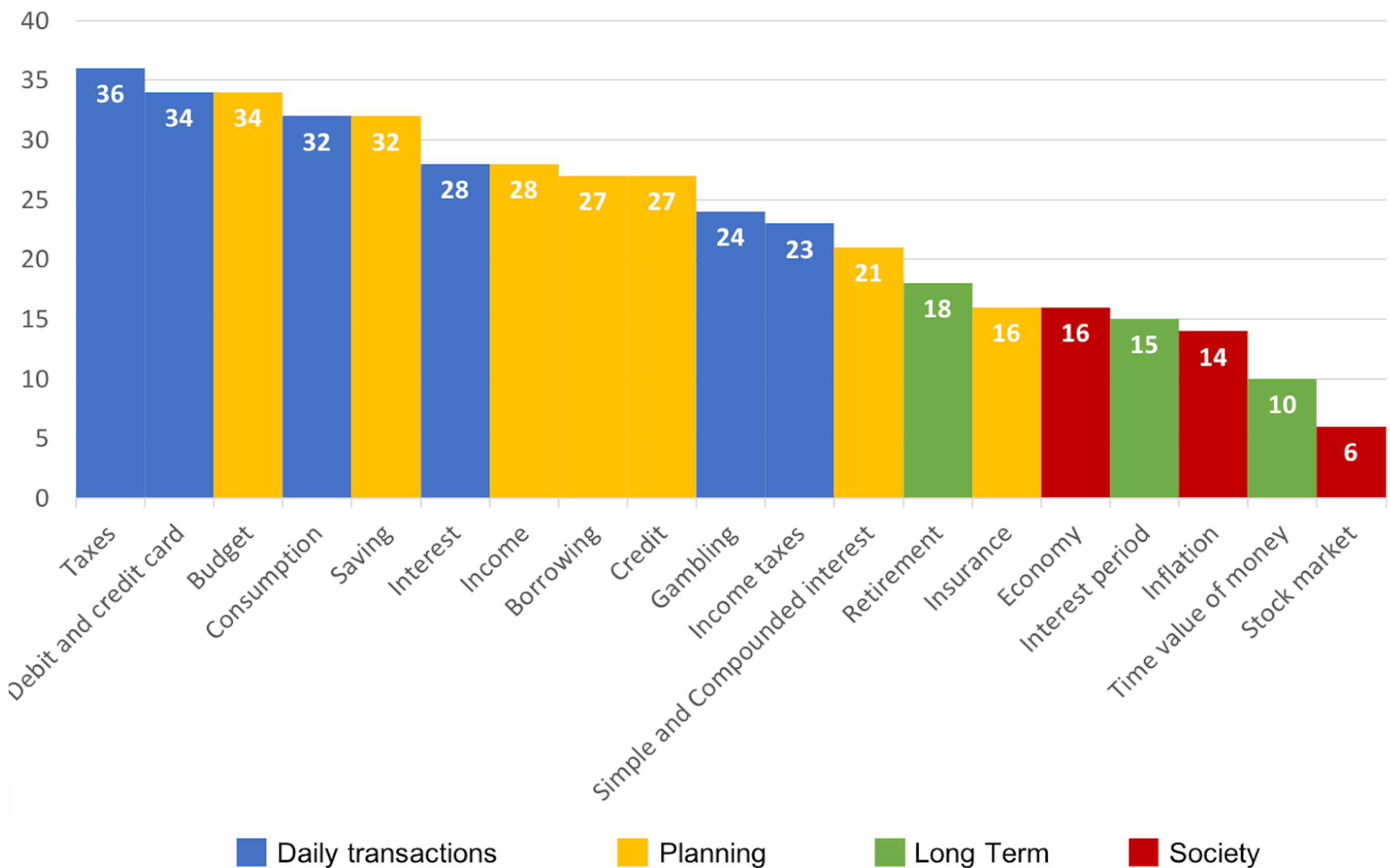
For this presentation we answered the following questions:

- With which financial concepts do teachers feel comfortable?
- Which mathematics content connects to these concepts?
- What does such connection reveal about teachers' content knowledge and their needs to teach FLE?

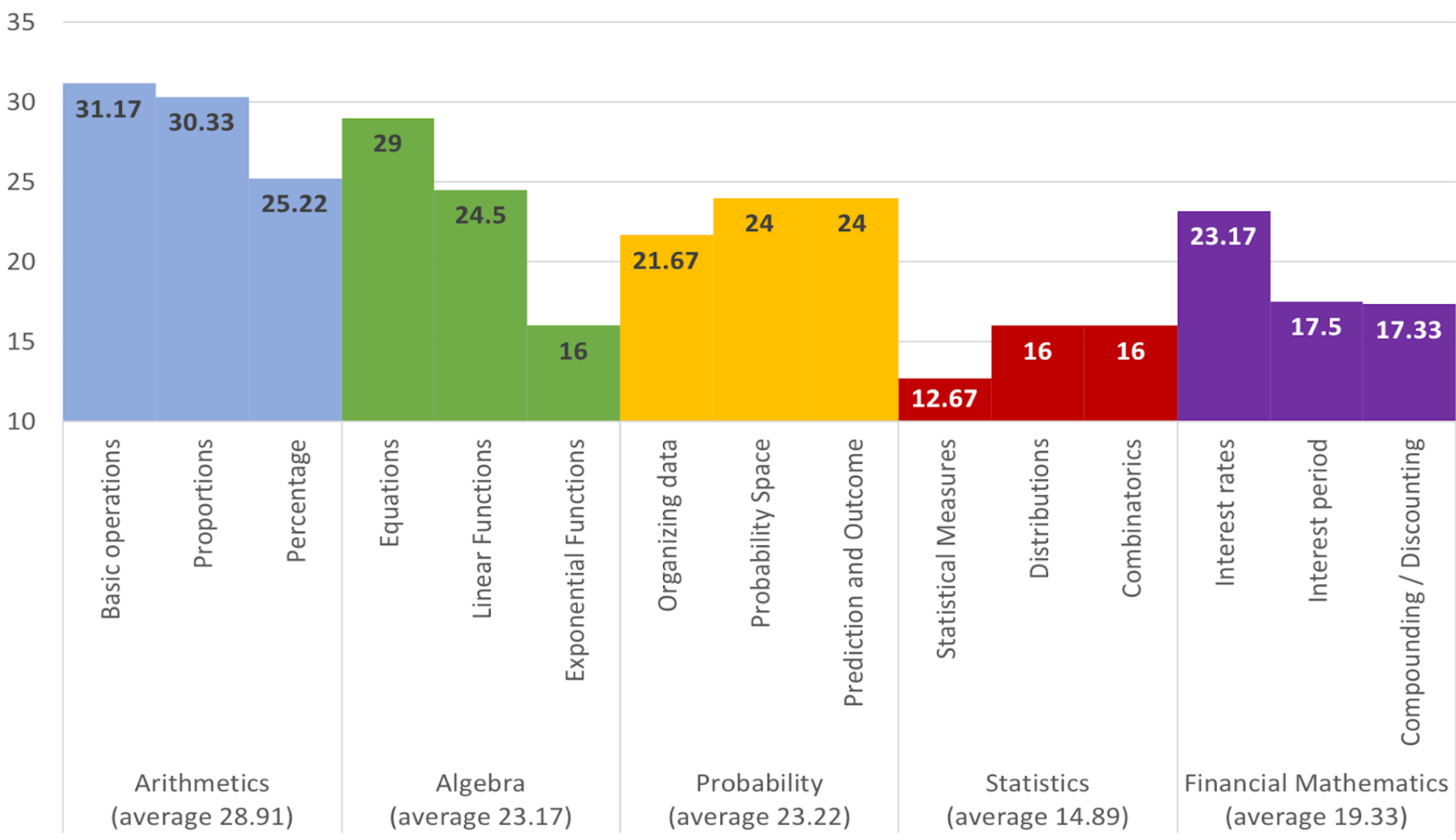
## Results & Implications

One of the sections of our online survey contained questions related to the financial concepts that teachers feel comfortable with. The graph on the right shows the results of such questions. All 36 teachers answered the questions.

Although we provided them with multiple choices to choose from, three questions related to their lesson planning were open ended and allowed them to introduce some new concepts that we had not thought of initially. These concepts will be part of our future analysis, but were not included in this graph.



From the framework provided by the OECD (2017), we divided the financial concepts into four categories. Consequently, we observe that the majority of teachers feel comfortable with concepts related to daily financial activities, either transactions of financial planning (which occurs repeatedly among adults).



Since the teachers are required to incorporate FLE in their mathematics classes, we wanted to connect the financial concepts with the mathematics curriculum in Québec. Therefore, we decided to categorize each financial concept according to the 3 most important mathematics topics required to understand it, and check the average of teachers who responded to such content.

The graph on the left presents the results of this categorization. The categories were provided according to the Quebec Education Program for secondary mathematics. Each branch of mathematics is subdivided into 3 areas from which the mathematics content stems.

Our findings suggest that teachers are more comfortable teaching financial concepts which require a simpler application of mathematical knowledge. On the contrary, we found that teachers were less comfortable with teaching financial concepts that require a more complex mathematical understanding, generally related to actuarial sciences and stochastic thinking. Based on these results, we understand that teachers need more opportunities to develop their knowledge of the content (financial concepts).

FLE can be incorporated with basic mathematics at the secondary level, but if we aim to deepen the students' understandings, it is important that teachers feel comfortable with less trivial aspects of FLE. The future steps of this research will be to triangulate these results with data from the focus groups and classroom observations to see investigate their pedagogical content knowledge and their needs for professional development.

## Contact

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