



Financial Numeracy in Mathematics Education: Research and Practice

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Abstract *Financial Numeracy in Mathematics Education: Research and Practice* is a book that brings unique and innovative ideas for using financial numeracy in learning mathematics in the classroom. The purpose of this book is to describe the different ways to integrate financial numeracy into mathematics classrooms. Empirical and conceptual studies related to the application of financial numeracy in learning are successfully discussed in this volume. This is perhaps the first book to comprehensively cover the theory and practice of financial numeracy in mathematics instruction. This book is ideal for instructors, lecturers, researchers, stakeholders, and anybody else interested in financial numeracy.

Résumé Le livre intitulé «*Financial Numeracy in Mathematics Education: Research and Practice* (La numératie financière dans l'enseignement des mathématiques: la recherche et la pratique)» propose des idées originales et novatrices liées à l'usage de la numératie financière dans l'apprentissage des mathématiques en classe. Cet ouvrage a pour objectif d'examiner la numératie financière dans les cours de mathématiques. On y aborde avec brio diverses études empiriques et conceptuelles liées à l'utilisation de la numératie financière dans le processus d'apprentissage. Cela représente peut-être le premier livre à étudier de manière approfondie la théorie et la pratique de la numératie financière dans l'enseignement des mathématiques. L'ouvrage s'avère idéal pour les enseignants, les chargés de cours, les chercheurs, les parties concernées et toute personne qui s'intéresse au bien-fondé de la numératie financière.

Keywords Financial numeracy · Mathematics education · Financial education

Being financially literate is an essential life skill that is beneficial to both the individual and society. Numeracy is one of the most important characteristics that can help people make better decisions in their lives. In financial numeracy, financial education and mathematics education are closely linked. It can be seen as a developmental construct arising from monetary contexts in which mathematics is used to

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measure financial behaviors pragmatically. Financial education has become a concern since the global economic crisis in 2008. The COVID-19 pandemic has had a major impact on the international and regional economies. Therefore, the skills related to financial education are crucial to educating people to be aware of and understand how to manage finances wisely according to their needs. A number of states, provinces and countries have revised their curriculum to include financial education in a variety of subjects (Aprea, 2016), as well as some universities have implemented courses on financial planning and student debt management (Gable et al., 2012). Meanwhile, academics and researchers have focused on the development of financial education knowledge from a variety of perspectives.

The book, *Financial Numeracy in Mathematics Education: Research and Practice* (Savard & Cavalcante, 2021), presents an integrated explanation of financial numeracy in mathematics classrooms. This volume is a collaborative research project from 2016 to 2019 in Quebec, Canada. As the editors state, “this book will be a guide in supporting the learning of financial numeracy teaching and learning, as well as developing collaborative projects in that emerging field of research” (p. v). The editors grapple with highlighting trends and implications of financial numeracy issues in education based on research and arguments with teachers, school board consultants, teacher educators, and scholars. The publication of this volume is timely, taking into consideration the fact that there are still limited resources that address financial education as an integral aspect of mathematics education in the digital era.

This book is divided into four parts, each containing two to four chapters dealing in detail with a particular topic, including consumer behaviour, financial choices and decision making, and debt and saving. Part one contains three chapters focusing on the theoretical foundations that motivate research projects. The next part, including four chapters, focuses on research project design. The empirical outcomes of the project’s implementation are presented in part three, which comprises two chapters. The final part centres on presenting two chapters, each of which provides the teacher’s perspective on the use of financial numeracy in mathematics classes.

In the first chapter, *Financial Education and Mathematics Education: A Cross-Cutting Analysis of the Epistemological Intersection of Financial Numeracy*, Annie Savard and Alexandre Cavalcante discuss the theoretical foundations of financial numeracy. They set the foundation of financial numeracy by explaining terms circulating in the financial education literature such as financial literacy, financial capability, and financial education. They state that financial numeracy is considered as an epistemological intersection between financial education and mathematics education.

In the second chapter, *Financial Numeracy as Part of Mathematics Education*, Annie Savard and Alexandre Cavalcante delve into what numeracy is and how it relates to the school mathematics curriculum. After more explanation about financial numeracy, they provide a theoretical foundation on the dimensions of financial numeracy components. In the next chapter, *An Overview of Financial Numeracy in the Quebec Curriculum*, Annie Savard, Alexandre Cavalcante, and Azadeh Javaherpour discuss how financial numeracy is implemented in the secondary school curriculum in Quebec. Quebec is an interesting case study example because it applies financial numeracy in the curriculum in three different ways: stand-alone discipline, interdisciplinary, and intradisciplinary.

In the fourth chapter, *Background and Implementation of the Project*, Alexandre Cavalcante and Annie Savard examine the background and contextual information about their project in Quebec. It explains the qualitative technique employed, the project objectives, and the research questions for the project. Authors discuss the data gathering process and highlight the restrictions and issues that come with it in this chapter.

Annie Savard and Daniela wrote the fifth chapter, *Building a Research Instrument on Financial Numeracy in Schools (Quebec and Romania)*. The authors introduce the data collection instrument in the form of an online questionnaire and the reasons why they use this research instrument is explored and explained in each section. This chapter shows how this research instrument was adapted for use in other countries such as Romania. The components of research instruments in the two countries

are then compared, and some methodological considerations for adapting the research instruments is discussed.

Using Tasks to Elicit Mathematics Teachers' Thinking in Financial Numeracy is the name of the sixth chapter. In this chapter, Louis-Philippe Turineck and Alexandre Cavalcante address the relevance of task design in mathematics classrooms and offer insights on how to use assignments to create conversation among teachers based on the views of those conducting focus groups (teacher educators vs. researchers).

In the chapter called *Financial Numeracy Research in the Digital Era: Ethical Considerations*, Annie Savard and Alexandre Cavalcante explain some considerations regarding ethics in conducting research projects involving financial issues. They discuss the process taken at the start of the project to obtain ethical approval from the relevant university, and describe the situation that occurred during the project and also the ethical problems experienced during the research. The authors believe that those considering implementing financial education projects in schools or among teachers would find this chapter informative.

Alexandre Cavalcante analyzes mathematics teachers' representations while discussing financial numeracy in teaching practices in the eighth chapter, *Mathematics Teachers' Financial Numeracy Representations and Practices*. Although most instructors recognized the necessity of incorporating financial numeracy into the classroom, the amount to which it was taught varied. The author then discusses the challenges and constraints that instructors face when teaching financial numeracy in the mathematics classroom.

In the ninth chapter, *Making Sense of Mathematics: Two Case Studies of Financial Numeracy in Grade 11 Mathematics Classrooms*, Alexandre Cavalcante and Annie Savard describe the learning flow and analysis of the results of two situations integrating financial numeracy into mathematics learning in grade 11. The students learn about linear regression in the science stream for mathematics (SN) to understand the financial context. To make mathematics learning more meaningful, this course uses a financial context to introduce a model. In contrast to the lesson on compound interest in the context of credit cards in the cultural social technical stream (CST), which tends to pragmatic measurement, students are more interested in discussing financial practices than the mathematical model. These examples show how financial numeracy can be taught in a variety of ways.

Benoit Brosseau and Jean-François Blanchet underline the importance of financial numeracy being taught early in school in their chapter *Financial Numeracy in Secondary Schools in Quebec: Implications for Leadership*. The financial context provides students with a genuine and meaningful challenge to solve, ensuring that the mathematics problems they learn in class are applicable in real life. Some Quebec secondary schools are already incorporating the financial context into the learning of some mathematics subjects. Teacher workshops, such as the one held in Quebec, provide a forum for mathematics teachers to explore the process of teaching financial numeracy in the classroom. This authors discuss their observations based on conversations with teachers and their experiences attempting to integrate financial numeracy into mathematics lessons.

Some Financial Numeracy Problems for Secondary-School Mathematics Classes, the final chapter, contains examples of financial numeracy tasks created by Louis-Philippe Turineck and supervised by Annie Savard. The assignments provided give interesting financial context situations that can be used in the classroom. Students' participation in their activities is emphasized in the tasks given in this chapter.

This book succeeds in offering a comprehensive overview of how financial numeracy is used in schools, from project design to the implementation of financial numeracy in mathematics classes. The many unique and innovative approaches presented in applying financial numeracy to studying mathematics are another highlight of this book. Additionally, there are more empirical chapters in this book than conceptual ones, so readers can get a sense of how to put theory into practice or

implement it. Despite the fact that this volume is dominated by authors from Canada, it also includes perspectives and contexts from other countries that apply financial numeracy in their curriculum, such as Romania.

In the introduction to each chapter, this book is equipped with important points that will be discussed. Unfortunately, there are no conclusions at the end of each chapter, although this book does provide an overall conclusion at the end of the book. The limitations and constraints experienced during the implementation of financial numeracy are also described in this book, so that they can be used as inspiration in developing a better financial numeracy learning situation.

This volume reassures those concerned in education that implementing financial numeracy successfully requires professional support. Finally, we believe that this work is well worth reading. We highly recommend this book to teachers, lecturers, researchers, stakeholders, and anybody else interested in financial numeracy.

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Declarations

Conflict of Interest The authors declare that they have no conflict of interest.

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