Open Access Library Journal
2025, Volume 12, e14124
ISSN Online: 2333-9721
ISSN Print: 2333-9705

A Curriculum Theory Analysis of the Prince Edward Island Grade 2 (PEI G2) Science Curriculum: Aligning Pedagogy, Content, and Inclusivity in Early Education

Ayda Abdulreza

Department of Educaction, The British University in Dubai, Dubai, United Arab Emirates
Email: Aydaabdulreza.edu@gmail.com

How to cite this paper: Abdulreza, A. (2025) A Curriculum Theory Analysis of the Prince Edward Island Grade 2 (PEI G2) Science Curriculum: Aligning Pedagogy, Content, and Inclusivity in Early Education. *Open Access Library Journal*, **12**: e14124.
https://doi.org/10.4236/oalib.1114124

Received: August 15, 2025
Accepted: September 13, 2025
Published: September 16, 2025

Abstract

This paper presents a critical analysis of the Prince Edward Island Grade 2 (PEI G2) Science Curriculum, part of the Atlantic Canada Framework and the pan-Canadian Common Framework of Science Learning Outcomes (K-12). Drawing on key curriculum theorists—Tyler, Taba, Stenhouse, Schwab, and Freire—the study examines how the curriculum aligns with pedagogical theory, content progression, and inclusive education principles in early science learning. Through a document-based qualitative approach, the analysis focuses on five dimensions: curriculum aims, pedagogical approaches, content sequencing, assessment alignment, and responsiveness to learner diversity. Findings indicate that while the PEI G2 curriculum is grounded in constructivist and progressive educational philosophies, it lacks clear scaffolding for inquiry-based learning and falls short in its practical support for inclusive teaching. References to inclusivity and formative assessment are present but insufficiently developed, and the absence of cultural responsiveness and digital literacy further limits its relevance to 21st-century educational needs. The paper concludes with theory-based recommendations to strengthen pedagogical clarity, adaptability, and equity in early science education.

Subject Areas

Curriculum Instruction

Keywords

Curriculum Theory, Prince Edward Island, Inclusive Education, Early Science Learning, Constructivist Pedagogy, Curriculum Critique, Assessment

Alignment, Pan-Canadian Framework

1. Introduction

In today's fast-evolving world of education, curriculum design is a significant key in creating meaningful and equitable learning opportunities for all students. Early education, specifically, faces increasing pressure to encourage scientific thinking, inquiry skills, and inclusive practices. To achieve all these goals, curriculum documents must clearly connect the teaching goals, content, and the different needs of diverse learners. However, there is often a gap between what curriculum theory suggests and what they are actually able to provide.

This paper will focus on the Prince Edward Island Grade 2 Science Curriculum Guide (referred to as the PEI G2), which is a part of the Atlantic Canada Framework and follows the pan-Canadian Common Framework of Science Learning Outcomes K-12. The curriculum document is a core planning tool for science education in the province and is positioned as a role model for early curriculum design. Hence, the document is suitable for critical analysis as it clearly provides an outline of the objective learning goals, focuses on inquiry-based science teaching, and follows constructive and inclusive education ideas. To ensure analytical clarity, this study adopts a curriculum theory lens that bridges foundational perspectives with contemporary inclusion-focused pedagogy.

The analysis will be guided by the following research question:

"*To what extent does the PEI G2 Science Curriculum align with pedagogical theory, content structure, and inclusive principles to support scientific literacy in early education*?"

The significance of this study lies in the critical role of primary-level curricula, which play a crucial role in shaping children's early experiences with science and affecting their long-term engagement with STEM learning. When curriculum design is grounded and supported by strong educational theories, it can support deeper understanding, inquiry, and inclusion from the earliest stages of learning. By analyzing the PEI G2 curriculum, this study will offer insights into how curriculum theories are used in this design and how they aim to promote equity, scientific and rational thinking, and meaningful knowledge development. In doing so, this paper contributes to international curriculum discourse by demonstrating how theoretical foundations can guide practical improvements in curriculum planning and delivery, particularly in diverse, early childhood contexts.

Moreover, to guide this analysis, the paper first explores foundational curriculum theories and recent scholarly debates shaping science education, especially in the early education context. It then provides a critical analysis of the PEI G2 science curriculum, focusing on aims, content, pedagogy, assessment, and inclusivity. The discussion will then engage in a critical reflection on the document's strengths and limitations. Finally, the analysis will end by gathering the main findings and giving practical, theory-based suggestions on how curriculum designers can possibly enhance early science education.

2. Literature Review

2.1. Curriculum Theories and Models

A key part of curriculum theory comes from Ralph Tyler's model [1], which is based on a clearly organized and goal-oriented process. Tyler highlighted the importance of the identification of educational objectives, the selection of learning experiences, and the evaluation of outcomes, which are contemporary principles in outcome-based education. However, critics have noted that although Tyler's approach is systematic and well-organized, it may oversimplify the complexities of the teaching and learning process, which limits the responsiveness of meeting diverse students' needs [2].

Building upon this structure, Hilda Taba suggested an inductive, teacher-led model that starts with diagnosing students' needs and progresses through selecting the content and evaluation in a more dynamic, feedback-based cycle [3]. Taba's emphasis on starting from classroom realities offers a bridge between theory and practice, particularly in primary education.

Lawrence Stenhouse challenged the idea of considering curriculum as a rigid, step-by-step plan by suggesting a process-oriented model [4]. Similarly, Joseph Schwab proposed a practical, reflective approach that emphasized teacher judgment and collaboration with stakeholders [5].

Paulo Freire's critical pedagogy introduced a transformative and socially grounded critique of curriculum [6]. Freire opposed the "banking model" of education and emphasized dialogue and critical consciousness. Giroux extended this vision by stressing the importance of inspiring students to question and engage [7].

Together, these theoretical perspectives highlight that curricula should be simultaneously structured, adaptable, and socially meaningful.

2.2. Contemporary Perspectives on Early Science Education

In the Canadian policy context, the *Canadian Multiculturalism Act* [8] legally mandates the federal government to promote cultural diversity and ensure equitable opportunities for all Canadians, including access to educational programs without discrimination based on race, ethnicity, or ability. Recent federal reports underscore ongoing implementation through multiculturalism and anti-racism strategies that emphasize inclusive access and culturally respectful school environments [9].

Empirical Studies on Culturally Responsive Science Education in Canada

Supporting the call for deeper inclusivity in science curricula, Copeland Solas [10] conducted a study of Ontario science teachers who integrated Black cultural references into lesson content—resulting in elevated engagement and achievement among Black students.

Additionally, Chen *et al.* [11] used bibliometric mapping to show that globally, research on culturally responsive pedagogies in early childhood education is on the rise, highlighting the growing scholarly emphasis on this area. These emerging studies and policy frameworks underscore both the necessity and feasibility of embedding deeper cultural responsiveness into early science curricula—particularly in multicultural contexts like Canada.

Research in early science education has constantly emphasized the importance of inquiry-based learning, curiosity, and conceptual understanding from a young age. According to Harlen [12], early exposure to scientific thinking promotes children's critical and rational reasoning development and supports engagement with STEM disciplines (Science, Technology, Engineering, and Mathematics).

According to Eshach and Fried [13], inquiry-based approaches that encourage questioning, prediction, and reflection have been widely considered as appropriate educational approaches.

Moreover, hands-on and exploratory methods in science education foster engagement, retention, and a deeper understanding of abstract concepts. Inclusion has remained a key principle in recent curriculum reform. Florian and Black-Hawkins [14] argued that inclusive education is a combination of integrating learners with special needs and designing a suitable curriculum that is responsive to the full spectrum of student diversity. This includes addressing linguistic, cultural, cognitive, and socioeconomic differences.

Additionally, research by Aikenhead [15] points to the need for culturally relevant science education, especially in culturally diverse contexts such as Canada, where diversity is the main characteristic of classrooms. Culturally relevant pedagogy ensures that learners can see their lived experiences and cultural identities reflected in the curriculum, which improves engagement and comprehension.

In the Canadian context, inclusivity is not only a pedagogical goal but also a policy mandate. The *Canadian Multiculturalism Act* [8] and subsequent national strategies on anti-racism and equity underscore the government's responsibility to ensure that education reflects Canada's cultural diversity. Recent studies extend this policy commitment into science education practice. For example, Copeland Solas [10] found that Ontario science teachers who incorporated Black cultural knowledge and narratives into lessons significantly increased engagement and achievement among historically marginalized students. Similarly, Chen *et al.* [11] highlighted through bibliometric mapping that research on culturally responsive pedagogies in early childhood science education has sharply expanded worldwide since 2021, reinforcing the urgency of aligning curricula with equity and diversity goals. Together, these findings emphasize that cultural responsiveness is both a national expectation and an emerging best practice for science education in Canada's multicultural classrooms.

Scholars have also highlighted the crucial role of teacher agency in implementing the curriculum effectively. While national documents provide organized, structured frameworks, their success and effectiveness often depend on the teacher's ability to implement and adapt content in meaningful and effective ways [16]. Without adequate autonomy or professional development, even well-designed curricula may fall short in practice.

Although this analysis does not investigate how the curriculum is implemented in a classroom setting, existing studies highlight the limitations of curriculum documents. While theoretical frameworks are essential in designing curricula that meet different learners' needs, the effectiveness of any curriculum also heavily depends on teachers' ability to interpret and implement it successfully.

2.3. Debates and Gaps in the Literature

Despite the broad support for outcome-based and inclusive curriculum models, critiques remain. For instance, Booth and Ainscow [17] pointed out that extreme focus on measurable aspects often limits the real purpose of education, such as creativity, dialogue, and ethical responsibilities. This is particularly relevant while analyzing the PEI G2 document's balance between specificity and flexibility.

Another key debate concerns the tension between standardization and localization. While national frameworks rigidly focus on equity and consistency, they may downplay the significance of community context and student voice [18]. In doing so, they risk producing curricula that are technically aligned but culturally disconnected.

This raises questions pointing to curriculum analysts regarding how adaptable a specific curriculum is in local classrooms. And more importantly, does the same curriculum enable teachers to innovate or improve the document while teaching?

Finally, while many curriculum documents include inclusive language and values, the depth of practical guidance for inclusive teaching often varies. According to Ladson-Billings [19], the *Index for Inclusion* encourages curriculum designers to integrate inclusion into all segments of planning, delivery, and assessment, not only as a written value but as an embedded structure. Whether the PEI G2 meets this fully remains a critical point for analysis.

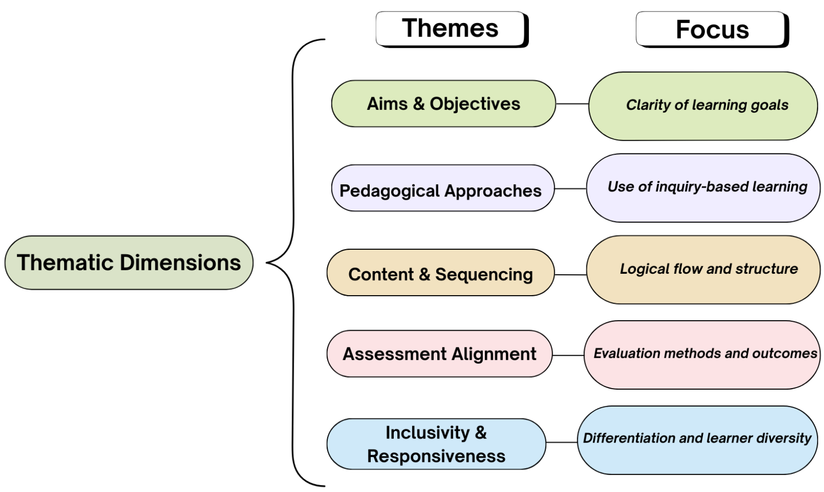
3. Methodology

This paper employs a document-based qualitative analysis to explore and evaluate the PEI G2 Science Curriculum (referred to as the PEI G2 Curriculum). This methodological approach is appropriate for examining the theoretical coherence, philosophical orientation, and inclusivity embedded within formal curriculum documents.

As this analysis was not involved in primary data collection, such as classroom observations, the analysis focuses on studying and understanding curriculum documents that are publicly available. The purpose of this methodological approach is to critically explore and evaluate whether the PEI G2 curriculum aligns with key curriculum theories and covers educational priorities such as inclusion, inquiry-based learning, and coherent pedagogical structure.

The rationale for selecting the PEI G2 Curriculum lies in its explicit reference to the pan-Canadian Framework for Science Learning Outcomes (K-12), its emphasis on outcome-based learning, and its relevance to early science education. The analysis takes place in a wider Atlantic Canada region, where the curriculum is considered a consistent but flexible teaching guideline for teachers. Moreover, this guideline presents both general and detailed learning goals and includes principles related to teaching, assessment, and student engagement. These key features make this document an ideal artifact for a theoretical critique grounded in curriculum studies.

To analyze this document, a theory-informed analytical framework was applied, focusing on different theoretical perspectives from several key curriculum models. The analysis method used is primarily thematic and interpretive (focusing on meaning behind the artefact), which focuses on five main dimensions of curriculum evaluation: 1) Aims and objectives, 2) Pedagogical approaches, 3) Content and sequencing, 4) Assessment alignment, and 5) Inclusivity and cultural responsiveness. Each of these key aspects is examined in relation to the curriculum document's language, structure, and expected and intended results. This framework allowed for a theory-informed and comprehensive critique of how well the PEI G2 Curriculum implemented these foundational principles.



Note: Created by Author.

Figure 1. Thematic dimensions and focus areas used in the analysis of the PEI G2 Science Curriculum.

To enhance methodological rigor, coding was conducted in several steps. First, deductive codes were generated directly from curriculum theories [1]-[5]. Next, relevant excerpts and phrases from the PEI G2 Curriculum were coded against these categories. Evaluation criteria included clarity of aims, inclusivity, pedagogical guidance, cultural responsiveness, and assessment adaptability. Reliability was improved by keeping reflexive notes during coding and by discussing a sample of decisions with peers, which increased transparency and reduced bias. Trustworthiness was established via triangulation across multiple theoretical lenses and by maintaining an audit trail of coding steps. At each stage of analysis, specific excerpts or paraphrased statements from the PEI G2 curriculum were extracted and coded against the five analytic dimensions. This allowed theoretical categories to be directly linked with textual evidence from the curriculum document.

To ensure that critiques were grounded in textual evidence, representative excerpts and paraphrased statements from the PEI G2 curriculum were included in the analysis. For example, phrases relating to "inquiry" or "assessment" were extracted and compared against theoretical expectations to highlight gaps between stated intentions and practical guidance. This strategy ensured that theoretical critiques were explicitly supported by the curriculum's own language.

As illustrated in **Figure 1**, the evaluation of the PEI Grade 2 Science Curriculum was guided by thematic dimensions such as aims and objectives, pedagogical approaches, content sequencing, assessment alignment, and inclusivity.

4. Analysis of the Curriculum Artefact

4.1. Curriculum Aims and Underlying Philosophy

The PEI G2 Science Curriculum outlines extensive learning goals along with specific expectations suitable for grade 2 students. Its stated goal is to empower and enhance the scientific knowledge of young learners through inquiry, relevance to real-life context, and connection to the environment and technology. For instance, the document states that "students will be expected to demonstrate curiosity about the natural world and use simple investigations to ask questions and gather evidence" (PEI Department of Education, 2002: p. 12). While this language highlights inquiry, it does not specify how teachers should scaffold investigations for students with varying developmental levels. This aligns with Tyler's emphasis on defining a clear educational aim and objective as a foundation for curriculum development [1]. However, unlike Tyler's linear model, which has been critiqued for being rigid [6], the PEI G2 document shows a more dynamic view by integrating flexibility in outcomes and offering differentiated examples for diverse learners.

Looking at the curriculum from a philosophical lens, it leans towards constructivism, as it emphasizes learning through each student's choice of inquiry, where students can choose different ways to respond to one unified academic requirement and engagement. This aligns with Piaget's theory of cognitive development, which highlighted the importance of hands-on, discovery-based learning experiences that match the student's developmental stage [20]. Moreover, the curriculum encourages students to explore and gain conceptual comprehension, which reflects this principle. Similarly, it aligns with Stenhouse's view of curriculum as a dynamic and ongoing process that is shaped by the communication between teacher and student [3]. Rather than being a fixed framework, the PEI G2 curriculum provides flexible guidelines that enable teachers to adapt content and methods based on their students' needs, which is one of the most crucial aspects of curriculum development. This flexibility is echoed in passages such as, "teachers may adapt suggested activities to meet the needs of their students while ensuring that the overall learning outcomes are addressed" (PEI Department of Education, 2002: p. 8). While this demonstrates adaptability, the document leaves the responsibility of interpretation largely to teachers without providing detailed scaffolding strategies.

This flexibility reflects a humanistic orientation, which values the learner's context and promotes meaning-making rather than content memorization [21]. While these philosophical foundations are well-established, some scholars are against this idealization. For instance, Biesta views the curriculum aims as a spectrum, ranging from solid, rigid, and measurable results-based achievements to loosely defined guidelines that are not clear [22]. He argues that both extremes are harmful and can weaken students' educational purpose.

4.2. Pedagogical Principles and Teaching Approaches

The emphasis on inquiry-based learning is the main characteristic of the PEI G2 curriculum, which is aligned with both Taba's inductive model [2] and Freire's critical pedagogy [4]. This type of instruction and teaching encourages students to ask questions, engage with ongoing explorations, and make predictions, which are key features of the constructivist approach that tend to empower students to have the role of co-constructors of their learning process [23]. For instance, the curriculum notes that "students will be expected to pose questions about the world around them and suggest ways to find answers through observation and exploration" (PEI Department of Education, 2002: p. 15). Yet, while this illustrates the spirit of inquiry, the document does not provide explicit scaffolding strategies to guide teachers in differentiating these investigations for learners with varying abilities.

However, the curriculum creates confusion as it does not clarify how this approach should be integrated and scaffolded across diverse classroom contexts. Moreover, while the curriculum mentions teaching principles, it seems that it expects or assumes that all teachers have the same level of pedagogical knowledge and independence, which could not always be applicable [24]. Furthermore, focusing on the curriculum's inclusive intentions, it does not fully address how inquiry-based teaching should be adapted for learners with Special Educational Needs (SEN), especially learners with cognitive or language-based difficulties. This creates a disconnection between teaching principles and practical accessibility for students with diverse needs, which naturally creates a critical gap in implementing inclusive and equitable education for all [12].

As a result, the curriculum may risk reinforcing educational inequalities if not accompanied by adequate guidance, teacher training, and differentiated instruction strategies. Adding to the analysis, Sweller *et al.* have challenged inquiry-based learning as well [25]. They have criticized the effectiveness of this approach to learning by arguing that applying pure inquiry can create confusion and overwhelm students, especially in the early stages of learning, rather than understanding and scaffolding. From this view, direct teaching and structured guidance can be more beneficial, as although inquiry-based learning is known for its freedom, it is crucial to have structured learning as well. Thus, a balance between exploratory freedom and instructional scaffolding must be maintained to optimize learning outcomes.

4.3. Content Structure and Sequencing

The curriculum document has provided the content in a logically sequenced way, which moves from more familiar topics like weather and materials to more complex and abstract concepts like systems and environmental effects. For example, the curriculum specifies that "Grade 2 learners should describe daily and seasonal changes in weather and explain their effects on living things" (PEI Department of Education, 2002: p. 27). While sequenced appropriately, such outcomes remain generic and miss opportunities to incorporate localized cultural or community-based contexts. This organized and sequenced structure aligns with the spiral curriculum theory suggested by Bruner (1969), where students revisit the core concepts they have learned previously to refresh their comprehension while learning new content.

However, some aspects of the curriculum's content lack cultural or local relevance. According to Aikenhead [18], a culturally responsive science class should include students' real-life experiences and reflect what they have learned from their own local communities. For instance, the curriculum mentions the STSE (Science, Technology, Society, and Environment) connections, but it has used examples that are too generic and do not reflect the diverse backgrounds of the students. As a result, despite the theoretical suggestions, the opportunities for critical and localized engagement with science content were underdeveloped and not considered. This raises questions about whose knowledge is legitimized in the curriculum and whether marginalized learners see themselves reflected in its narratives.

If this underdevelopment continues, students may find it difficult to connect science to their everyday lives and cultural backgrounds, which can reduce motivation, engagement, and most importantly, conceptual understanding for students who come from migrant backgrounds. However, although Aikenhead [18] strongly suggested incorporating culturally relevant scientific concepts, Ladson-Billings [19] has looked at this concept differently. She suggested that the implementation of being culturally responsive can become superficial if the teacher does not have a clear understanding of students' cultures or if the curriculum itself is not flexible.

Additionally, Banks [26] suggested a transformative approach, arguing that culturally responsive education goes beyond inclusion; it is about carefully evaluating how knowledge is constructed and whose voices are dominant. According to Banks, a "balanced" curriculum should incorporate both universal scientific principles and localized (student-centered) knowledge that encourages students to link what they have learned in school to their everyday life experiences, while also engaging with the bigger ideas within the subject. To operationalize this, curriculum developers should embed community-based examples and encourage teachers to use localized phenomena to illustrate scientific concepts. These mixed perspectives highlight that while cultural relevance is crucial, it should be thoroughly studied and applied by preparing teachers, providing institutional support, and having cyclical review routines to ensure the effectiveness of the curriculum's impact.

4.4. Assessment Alignment and Relevance to the Learner

Focusing on the PEI G2 curriculum, it has a connection between assessment approaches to its learning outcomes, which provides examples about how teachers evaluate students' understanding, such as through observations, engagements, and student reflections. For instance, the guide suggests that "teachers may use observation checklists and student science journals to record evidence of learning" (PEI Department of Education, 2002: p. 42). However, these examples lack sufficient detail on how to adapt assessments for students with special educational needs or from diverse linguistic backgrounds. This aligns with what Schwab [5] suggested, which encourages "Teacher Judgment" in applying assessments.

However, the curriculum does not provide a clear guideline. While it encourages formative feedback and process-based evaluation, it does not provide practical and sufficient tools or even differentiated techniques for evaluating students with various learning needs. This lack of actionable guidance may result in inconsistent implementation across classrooms, especially in under-resourced contexts. Biesta [22] critiqued modern curricula because they overly focus on rigid and measurable achievements, which can exclude or insufficiently support students with special needs. As Booth and Ainscow [17] suggested in the Index for Inclusion, an inclusive curriculum should integrate diverse assessment techniques to accommodate all types of learners.

To ensure equity, future revisions of the curriculum should expand on adaptable assessment strategies, incorporating multiple modes of demonstration such as oral, visual, or performance-based outputs.

5. Discussion

The PEI G2 curriculum shows that it is conceptually strong, built on contemporary curriculum theories, and tries to provide pedagogical instructions. However, although this curriculum is well-organized and structured, it does not fully help the instructor to apply it.

One key strong feature of this curriculum is its philosophical alignment with constructivist and progressive educational theories. Moreover, it highlights and focuses on inquiry-based learning, real-life application, and students' engagement through the learning process, which reflects Piaget's [20] developmental stages and Stenhouse's [4] model of curriculum. The Curriculum's attention to scientific literature, such as environmental knowledge and technological connections, shows that the PEI G2 curriculum prioritizes global educational practices and allows students to benefit from STEM (Science, Technology, Engineering, and Mathematics) [12]. This early exposure to scientific inquiry supports the development of transferable problem-solving skills and curiosity-driven learning, which are foundational for later STEM engagement.

However, compared to the literature and best practices, this document shows several gaps. For instance, on one hand, the curriculum encourages inquiry-based learning techniques, but on the other hand, it does not clarify how scaffolding should be implemented in classes with diverse needs of students. This aligns with the concern that was raised by Priestley and Biesta [27], who stated that the problem with modern (contemporary) curricula is that teachers are independent, but sometimes they do not provide enough support, such as professional development training, to help them. In other words, in schools that have limitations in resources or whose teachers are not familiar with constructivist pedagogy, without clear implementation strategies and ongoing teacher support, the curriculum risks remaining aspirational rather than actionable. Instructivist approaches could create gaps in effective implementation.

Moreover, the PEI G2 curriculum provides clear learning goals, but sometimes it does not clearly explain how teachers should be inclusive in classrooms with students with diverse needs or Special Educational Needs (SEN) in real contexts. Literally, the language of inclusivity is present, but as Florian and Black-Hawkins [14] warn, inclusion and equity go beyond surface policy statements and should be implemented in classroom practices. For example, assessment adaptivity, easy content accessibility, and cultural responsiveness are practical types of inclusive measures that should be embedded into science curricula.

Recent Canadian studies confirm this gap: Copeland Solas [10] showed that culturally responsive science instruction in Ontario classrooms improved engagement and achievement for marginalized learners, while Chen *et al.* [11] demonstrated that global research trends increasingly prioritize culturally responsive pedagogy in early science education. Yet, the PEI G2 document does not provide concrete culturally rooted practices, leaving a disconnect between national inclusivity policies such as the Canadian Multiculturalism Act [8] and federal equity strategies [9] and the curriculum's practical classroom guidance. This disconnect indicates that while the PEI G2 aligns philosophically with inclusivity, it fails to operationalize it in ways that meet both policy mandates and emerging best practices.

Focusing on assessment, the PEI G2 curriculum promotes formative assessment and reflective learning, which are aligned with Schwab's [5] practical model. However, Biesta [22] suggested that if the curriculum focuses on outcomes and meets standardized aspects, it would negatively affect students' educational experience. The PEI G2 curriculum does not clearly address how teachers should examine or evaluate students' content comprehension. According to Harlen [28], assessment should not only measure students' outcomes, but it must empower them. However, this curriculum document has not provided enough direction on how the assessments will empower students through increasing their self-esteem (student agency), which creates a barrier for this document to meet metacognition skills. This gap underscores the need to shift assessment from a measurement tool to a developmental tool—one that nurtures student confidence, autonomy, and reflective capacity.

Although there are some criticisms, the PEI G2 curriculum shows potential as well. Providing a well-organized structure, age-appropriate content for Grade 2 students, and promoting crucial approaches like inquiry-based learning are examples of this document's potential to support high-quality science education in the early years.

Moreover, this curriculum aligns with the national educational goals in the Canadian context through the pan-Canadian framework, which enables different provinces in Canada to be consistent but still gives some room for local flexibility. This balance between national coherence and regional adaptability is a strength that, if further developed, could model scalable curriculum frameworks for diverse educational contexts globally.

6. Conclusions

Through a theory-informed perspective, this analysis has critically evaluated the PEI G2 Curriculum document by focusing on how well this artefact matches with key curriculum models, inclusive pedagogy, and inquiry-based learning.

In answering the proposed research question, the analysis suggested that the PEI G2 document is built on a strong conceptual context and is aligned with constructivist and progressive educational philosophies [1] [3] [4] [6]. Moreover, it offers an organized framework with clear outcomes, provides scientific knowledge from an early age (Grade 2), and encourages inquiry-based learning [12] [13]. These strengths reflect a forward-thinking approach to curriculum design that aspires to meet the cognitive and developmental needs of early learners.

However, the analysis has identified key challenges that this document could face in implementing these ideals into real-life practice. To be more specific, although this document promotes inclusive and inquiry-based learning, it does not clearly specify how or to what extent these approaches should be practiced or implemented in diverse classroom settings [14] [27]. Moreover, while it is mentioned that formative assessment will be applied, the lack of a detailed guideline is visible because it does not provide any support for teachers to apply this type of assessment to a broad range of students [28].

Additionally, knowing that this curriculum is dominantly used in Canada, which is a country full of diversity, the document has reflected on this crucial aspect very vaguely, which could have benefited from more detailed culturally responsive content to enhance its support for diverse learners across Canada [8]-[11].

Based on the findings of this analysis, **Table 1** suggests several evidence-based recommendations that would improve this curriculum in its practicality, inclusivity, and pedagogical clarity:

Table 1. Recommendations for improving the PEI G2 curriculum.

Recommendation	Rationale
Provide more detailed and clear information and Detailed scaffolding inquiry-based learning.	Supports teacher implementation of constructivist pedagogy across varied student needs.
Incorporate differentiated assessment tools	Ensures that all students are fairly evaluated and supports equity and inclusion.
Offer professional development training for teachers that is aligned with what the curriculum requires of them.	Enables teachers to have a better understanding of the artefact and implement it more meaningfully.
Involve teachers and educational communities in future curriculum revisions	Ensures the curriculum is both nationally and locally relevant.
Develop a practical *Inquiry Scaffolding Template* (step-by-step prompts for questioning, predicting, observing, and reflecting).	Gives teachers a structured framework to guide students through inquiry without leaving struggling learners behind [25]
Provide a *Differentiated Assessment Rubric* (with multiple pathways—written, oral, visual, and performance-based demonstrations).	Ensures that assessment captures diverse learner strengths, aligns with inclusive pedagogy, and promotes equity in science classrooms [26]

Note: Created by the author.

In conclusion, the PEI G2 curriculum demonstrates a strong foundation for science education in Grade 2. Explicit tools such as scaffolding templates and differentiated rubrics can turn its philosophy into practice, effectively bridging the gap between aspirational goals and classroom realities. With thoughtful improvements in guidance, inclusivity, and teacher support, the curriculum holds the potential not only to meet current expectations but also to exceed them by addressing the evolving needs of diverse learners. Overall, this analysis finds that the PEI G2 curriculum partially aligns with pedagogical theory and inclusivity principles—conceptually strong but lacking sufficient practical guidance to fully support diverse classrooms.

Conflicts of Interest

The author declares no conflicts of interest.

References

[1] Tyler, R.W. (1949) Basic Principles of Curriculum and Instruction. University of Chicago Press.

[2] Biesta, G. (2010) Good Education in an Age of Measurement: Ethics, Politics, Democracy. Routledge.

[3] Taba, H. (1962) Curriculum Development: Theory and Practice. Harcourt, Brace & World.

[4] Stenhouse, L. (1975) An Introduction to Curriculum Research and Development. Heinemann.

[5] Schwab, J.J. (1969) The Practical: A Language for Curriculum. *School Review*, **78**, 1-

23. https://doi.org/10.1086/442881

[6] Freire, P. (1970) Pedagogy of the Oppressed. Continuum.

[7] Giroux, H.A. (1988) Teachers as Intellectuals: Toward a Critical Pedagogy of Learning. Bergin & Garvey.

[8] Government of Canada (1985) Canadian Multiculturalism Act.

[9] Government of Canada (2019) Building a Foundation for Change: Canada's Anti-Racism Strategy 2019-2022. Canadian Heritage.

[10] Copeland Solas, D. (2018) Culturally Responsive Pedagogy in Ontario Science Classrooms. *Canadian Journal of Science Education*, **40**, 112-128.

[11] Chen, J., Huang, K. and Zhang, L. (2021) Trends in Culturally Responsive Pedagogy: A Bibliometric Analysis. *Early Childhood Education Journal*, **49**, 823-838.

[12] Harlen, W. (2000) The Teaching of Science in Primary Schools. Routledge.

[13] Eshach, H. and Fried, M.N. (2005) Should Science Be Taught in Early Childhood? *Journal of Science Education and Technology*, **14**, 315-336. https://doi.org/10.1007/s10956-005-7198-9

[14] Florian, L. and Black-Hawkins, K. (2011) Exploring Inclusive Pedagogy. *British Educational Research Journal*, **37**, 813-828. https://doi.org/10.1080/01411926.2010.501096

[15] Aikenhead, G.S. (2006) Science Education for Everyday Life: Evidence-Based Practice. Teachers College Press.

[16] Priestley, M. and Biesta, G. (2013) Reinventing the Curriculum: New Trends in Curriculum Policy and Practice. Bloomsbury Publishing.

[17] Booth, T. and Ainscow, M. (2011) The Index for Inclusion: Developing Learning and Participation in Schools. CSIE.

[18] Aikenhead, G.S. (1996) Science Education: Border Crossing into the Subculture of Science. *Studies in Science Education*, **27**, 1-52. https://doi.org/10.1080/03057269608560077

[19] Ladson-Billings, G. (1995) Toward a Theory of Culturally Relevant Pedagogy. *American Educational Research Journal*, **32**, 465-491. https://doi.org/10.3102/00028312032003465

[20] Piaget, J. (1970) The Science of Education and the Psychology of the Child. Orion Press.

[21] Rogers, C. (1969) Freedom to Learn. Merrill.

[22] Biesta, G. (2007) Why "What Works" Won't Work: Evidence-Based Practice and the Democratic Deficit in Educational Research. *Educational Theory*, **57**, 1-22. https://doi.org/10.1111/j.1741-5446.2006.00241.x

[23] Dewey, J. (1938) Experience and Education. Macmillan.

[24] Shulman, L.S. (1986) Those Who Understand: Knowledge Growth in Teaching. *Educational Researcher*, **15**, 4-14. https://doi.org/10.3102/0013189x015002004

[25] Sweller, J., Ayres, P. and Kalyuga, S. (2011) Cognitive Load Theory. Springer.

[26] Banks, J.A. (2008) Multicultural Education: Issues and Perspectives. Wiley.

[27] Priestley, M. and Biesta, G. (2013) Reinvention of Curriculum: National Frameworks and Teacher Agency. *Curriculum Journal*, **24**, 3-25.

[28] Harlen, W. (2013) Assessment and Inquiry-Based Science Education: Issues in Policy and Practice. Global Network of Science Academies (IAP).