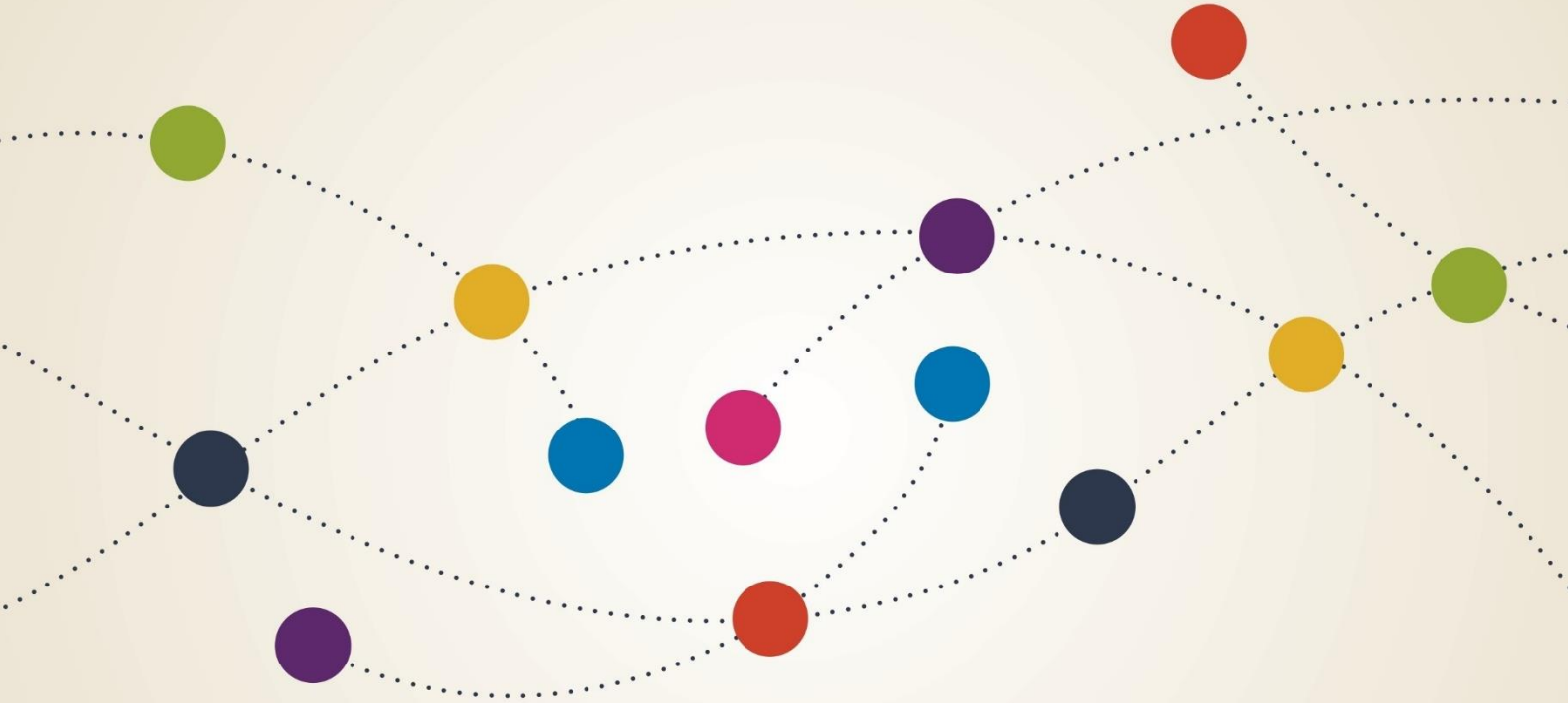

Consultation Report on the Primary Mathematics Curriculum for junior infants to second class

NCCA
An Chomhairle Náisiúnta Curaclaim agus Measúnachta
National Council for Curriculum and Assessment

July 2018

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Chapter 1. Introduction

The development of a new Primary Mathematics Curriculum (PMC) for junior infants to second class was set out in the NCCA's Strategic Plan, 2015-2018, and was further highlighted in the DES Action Plan 2017. Following a period of developmental work, the draft curriculum specification for junior infants to second class was published on the NCCA website in November 2017 for consultation. This report details the consultation process, the procedures for gathering and analysing feedback, the implications for the continuing development of the PMC and recommendations arising from the findings.

Development process

In 2014, NCCA published two mathematics research reports (Dunphy et al., 2014; Dooley et al., 2014) in addition to an audit of mathematics curriculum policy across 12 jurisdictions (Burke, 2014). Building on this work, Autumn 2016 saw the publication of a background paper and brief intended to support the development of the draft PMC[1].

In September 2016, an Early Childhood and Primary Mathematics Development Group (EPMDG) was established, with representatives of stakeholder groups including the DES Inspectorate, management organisations, teacher representatives, SEN and members recruited through a public application process[2]. Since then, the NCCA executive has worked with the EPMDG, the Board for Early Childhood and Primary, and Council, to fulfil the brief and adhere to the guiding principles set out in the background paper. This work has endeavoured to formulate a vision for the draft PMC that would maintain the integrity of mathematics as a discipline, whilst also connecting with the Primary Language Curriculum for junior infants to second class published in 2015. It is also important to note that developments of the PMC commenced in advance of an established wider-redevelopment of the Primary Curriculum. Initial work on these redevelopments have now commenced and will feed into the continued development of the PMC. For an outline of key PMC developments to date see Appendix C.

[1] The research reports, audit, background paper and brief can be found at www.ncca.ie/primarydevelopments .
[2] For names and affiliations of development groups members see Appendix D.

Context for change

The development of the draft PMC specification sought to build on the success of the 1999 Primary School Mathematics Curriculum and *Aistear, the Early Childhood Curriculum Framework* (NCCA, 2009), and to address issues raised in a number of publications, including curriculum implementation reviews and evaluations (DES, 2005; Murchan et al, 2005; NCCA, 2005, 2009) and international and national assessments (Eivers et al, 2010; Mullis et al, 2012; Sheil et al, 2014). Developments also sought to respond to calls from teachers to reduce curriculum overload and allow for greater teacher autonomy and agency in managing teaching and learning in their classrooms (INTO, 2015).

A key influence on the structure of the draft PMC has been the need to promote inclusion and support children with special educational needs (DES, 2011). In developing a curriculum for all, it is important that all children can access learning as part of curriculum provision. Broad learning outcomes aim to provide for multiple means through which children can represent and express their learning and understanding, and also through which they can engage with learning in classrooms. The shift from curriculum objectives (DES, 1999) to broad Learning Outcomes in the draft PMC highlights the fresh emphasis placed on rich learning experiences for all children.

While mathematics as a discipline remains largely unchanged since the publication of the 1999 curriculum, evidence from the research reports referenced above point to a new vision for children's learning in mathematics, and correspondingly, the pedagogical approaches for supporting this learning. The draft PMC promotes the provision of rich learning environments where children can explore mathematical concepts through understanding and connecting their learning within mathematics and across other areas of the curriculum; higher-order thinking and reasoning; communicating and representing their thinking; and also through applying their learning and problem-solving in meaningful real-life contexts[3].

[3] A more detailed outline of the context for changes to the curriculum can be found in the Background Paper and Brief for development of the PMC (NCCA, 2016), Research Report No.17 (Dunphy et al, 2014), Research Report no. 18 (Dooley et al, 2014) and the Audit of Mathematics Curriculum Policy across 12 Jurisdictions (Burke, 2014).

Aims and rationale of the consultation

A critical component of NCCA's curriculum development processes is consultation with stakeholders. The purpose of the consultation on the draft PMC was to provide an opportunity for teachers, schools, parents, children and other interested parties to express their views and inform developments of the PMC going forward.

The aim of the consultation was primarily to address the following questions:

- What are teachers', parents' and children's perspectives on the draft primary mathematics specification?
- What are key considerations for future developments?
- How can we best promote the key messages underpinning the new primary mathematics curriculum?
- What types of supports do teachers and parents want/need to support them to implement the new primary mathematics curriculum?

Chapter 2. Methodology

Consultation on the draft specification commenced in late October 2017 and closed on the 16th of March 2018, following a brief extension at the request of teacher representatives. This chapter outlines the overall design of the consultation process, as well as the methods of data collection and analyses employed. In addition, the strategies for eliciting stakeholders' engagement and responses will be briefly outlined. The consultation process comprised three main strands, designed to collect both quantitative and qualitative data through a mixed methods approach, defined as …*collecting, analysing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone* (Creswell and Plano Clark, 2007, 5). Quantitative data was gathered through an online questionnaire, designed with support from the ESRI. Qualitative data was collected through field notes, focus group discussions and written feedback, and in the case of the children, drawings.

Data collection

Questionnaire: The questionnaire was open online to teachers, parents and the general public from November 15th, 2017 to March 16th, 2018. In all, 1,104 persons responded to the survey, though not all participants answered all questions. The questionnaire contained 37 question items in total. This was inclusive of two dedicated sections for teachers and parents to contribute their views. The questionnaire data can be viewed as a combination of mainly quantitative items (33 of 37 items), where participants selected a response (e.g., strongly agree, agree, disagree, strongly disagree, don't know) and qualitative items (4 of 37 items), where participants provided a written comment in response to an open-ended question.

Seminars: Three consultative seminars were held in Limerick, Sligo and Dublin on January 30th, 31st and February 1st respectively. Data gathered through the seminars was qualitative, given that *qualitative study means that researchers try to get as close as possible to the participants*… (Creswell, 2007, 18). Data was gathered through participant notes, field notes and questionnaires completed by 90 of 99 participants. In addition, focused seminars were conducted with the Professional Development Service for Teachers (PDST) and the National Parents Council Primary

(NPCP). Group interviews and participatory workshops were utilised as the primary data collection methods for these focused seminars. In addition to the qualitative data gathered through the seminars, the NCCA received four written submissions[4] (See Appendix E for details).

School Network: From October 25th, 2017 to March 15th, 2018, NCCA worked with a network of nine schools[5], identified through a public call for expressions of interest in contributing to the development of the PMC. The network represented both a geographical and contextual spread of school type, including: urban DEIS, rural DEIS, Scoil sa Ghaeltacht, Gaelscoil, special school, school with special classes, small rural and large urban. Data gathered was primarily qualitative because, as Flick (2009, 59) notes, qualitative research is characterised by an emphasis on the participants' perspectives and on the meanings they themselves assign to their lived experience. There were three meetings of the school network: An introductory meeting in October 2017, a second in January 2018 and a final reflective session in March 2018. Data was gathered through group interviews, participatory workshops and field notes. In between each of these gatherings, NCCA Education Officers visited each school, gathering data through professional conversations and dialogue.

The school network strand also provided an opportunity to explore children's perspectives, based on their mathematical learning experiences from junior infants to 2nd class. Grounded in qualitative research, this activity sought to elicit the worldview of the children and create new knowledge and understandings (Rossman and Rallis, 2012), thereby endeavoring to give children a voice (Cohen, Mannion, & Morrison, 2011). James (2007) notes that 'voice' represents children as participants rather than objects in the research process. The purpose of this aspect of the consultation process was to enable children in the schools to voice their experiences of learning, where the teacher had enacted an aspect of the new draft PMC. Participating teachers had autonomy on how they gathered children's perspectives, and consequently the artefacts collected (mainly drawings) are not in a standardised format. The total number of artefacts included in the analysis was fifty-four.

[4] Written submissions were received from the Irish National Teachers Organisation (INTO), An Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta (COGG), the National Council for Special Education (NCSE) and from the Staff of St. Paul's N.S. in Rathoath, Co. Meath

[5] Ten schools were originally recruited, but one school left the network due to unforeseen circumstances.

Data analysis

Questionnaire: For the questionnaire, analysis of the quantitative data involved running descriptive statistics (frequencies) and tabulating the data before presenting it in graphic form for this report. Where large proportions of respondents did not answer a question, this is indicated in the findings. A spreadsheet with the tables underlying each graph in this report was prepared. Qualitative responses were analysed by first validating responses (that is, eliminating those that did not address the question that was asked), and then coding each response according to the main topic or topics that it addressed. Then responses were quantified under each topic, and example responses were identified for reporting purposes. Where a response covered more than one topic, it was necessary to assign the category that the comment primarily addressed.

Care should be exercised in interpreting the outcomes of the questionnaire. It is unclear how representative the respondents were of teachers in general, teachers of junior primary classes, or indeed parents. Only small numbers of respondents provided demographic information (e.g., school type, school size, current class level(s), and hence it was not possible to break the data down by subcategory. This is a significant limitation. It might also be noted that participants responding to the draft curriculum would not have had access to CPD that might have supported them in understanding its rationale and structure. On the other hand, many would have been familiar with the Primary Language Curriculum launched in 2015, and this may have influenced their thinking in evaluating the draft mathematics curriculum, as there are commonalities across both (e.g., Learning Outcomes, Progression Continua).

School network, seminars, submissions and children's artefacts: Across the other strands of the consultation, the primary method of data analysis was thematic analysis, which *is a method for identifying, analysing, and reporting patterns (themes) within data* (Braun and Clark, 2006, 6). Braun and Clarke (2006) provide a six-phase guide which is a very useful framework for conducting this kind of analysis. The process itself is iterative and reflective, develops over time and involves a constant moving back and forward between phases (Nowell, Norris, White & Moules, 2017). The following describes the process of analysis applied to the qualitative data gathered through the consultation.

Table 1: Six step approach of thematic analysis

Step 1: Become familiar with the data	Step 2: Generate initial codes	Step 3: Search for themes
Step 4: Review themes	Step 5: Define themes	Step 6: Write-up

Step 1: Become familiar with the data: The involved repeated reading of the data in an active way, searching for meanings and patterns and highlighting these patterns in the various data sets.

Step 2: Generate initial codes: The patterns identified in step 1 were organised a systematic way. Coding reduced the data into small chunks of meaning, and open coding was used which ensured no pre-set codes were in place.

Step 3: Searching for themes: The coded data was collated and sorted into identifiable themes.

Step 4: Reviewing themes: During this phase, each theme was reviewed to confirm a coherent pattern, accurately reflecting the meanings evident in the data set. Following this review, a number of themes were combined to form the final suite.

Step 5: Defining and naming themes: During the fifth step, the core meaning of each theme (collated data) was captured through naming the themes, thereby capturing and highlighting the main areas of interest.

Step 6: Producing the report: Writing up of the findings (as presented in Chapter 3) began once the data analysis described in Steps 1- 5 had been completed.

The method of analysis adopted for analysing children's voice was an adapted version of thematic analysis (Braun and Clark, 2006). The process of analysis was inductive and interpretive in nature yet grounded in the data. In light of the respect for children's perspectives in this study, In Vivo codes were used in order to name themes. In Vivo coding simply uses the language of the participants to create codes (Charmaz, 2006; Cresswell, 2013; Saldaña, 2009) and assists us in remaining true to the children's voices (Saldaña, 2009).

Chapter 3. Findings

Findings from each strand of the consultation process are presented in standalone sections for clarity. These findings result from the data collection and analysis processes described in Chapter 2 and they form the basis for the discussion and recommendations presented in Chapter 4.

Questionnaire

The structure of findings from this strand follow the structure of the online survey. After considering the characteristics of respondents (for which much information was missing), specific topics are considered which include:

- The rationale for the new PMC
- The Strands and Elements
- The Learning Outcomes and labels
- The Progression Continua and Milestones
- The aims of the curriculum
- Reflections on curriculum change
- School context.

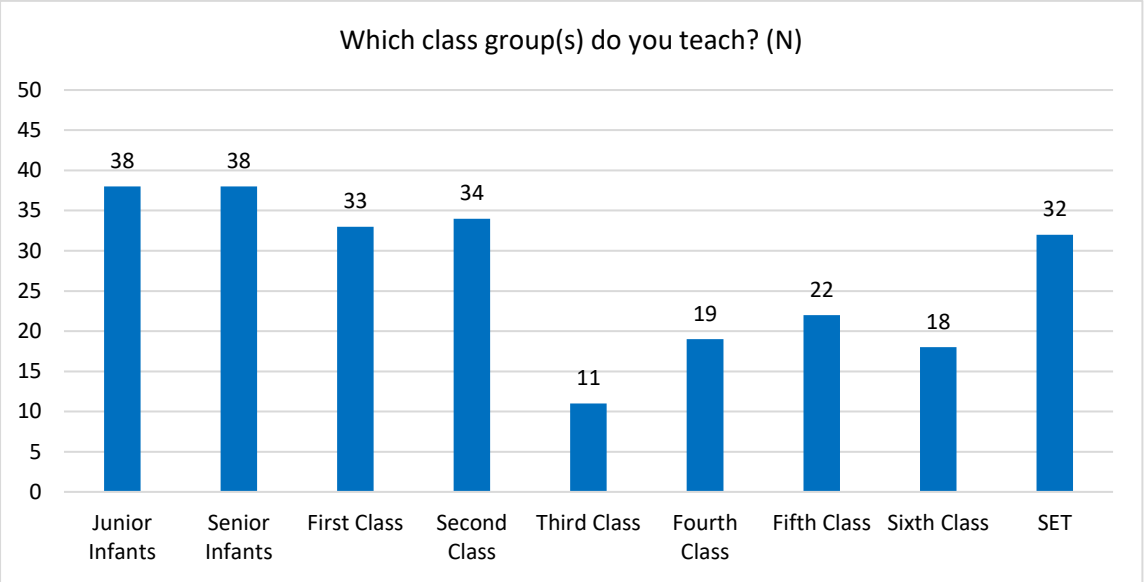
Analyses of open-ended questions are also provided. Findings conclude with a summary of the outcomes.

Characteristics of respondents

There were 1,104 responses to the questionnaire. Of the 1,104 participants, 631 (57%) indicated the perspective they drew on as they responded to the questionnaire. These included primary teachers (466, or 74% of 57%), primary principals (81 or 13%), primary deputy principals (45 or 7%), parents (16 or 3%), or others (15 or 2%). There were fewer than 1% in the categories of second level teachers, second-level principals or deputy principals, special needs assistants, educators from the higher education sector, educators from the further education sector, or students.

Between 30 and 40 teachers reported that they taught each of junior infants, senior infants, first and second classes, while 32 were teachers of children with special education needs (SET). However, many respondents did not indicate the grade level(s) which they taught.

Figure 1: Breakdown of respondents by class(es) taught - number of respondents



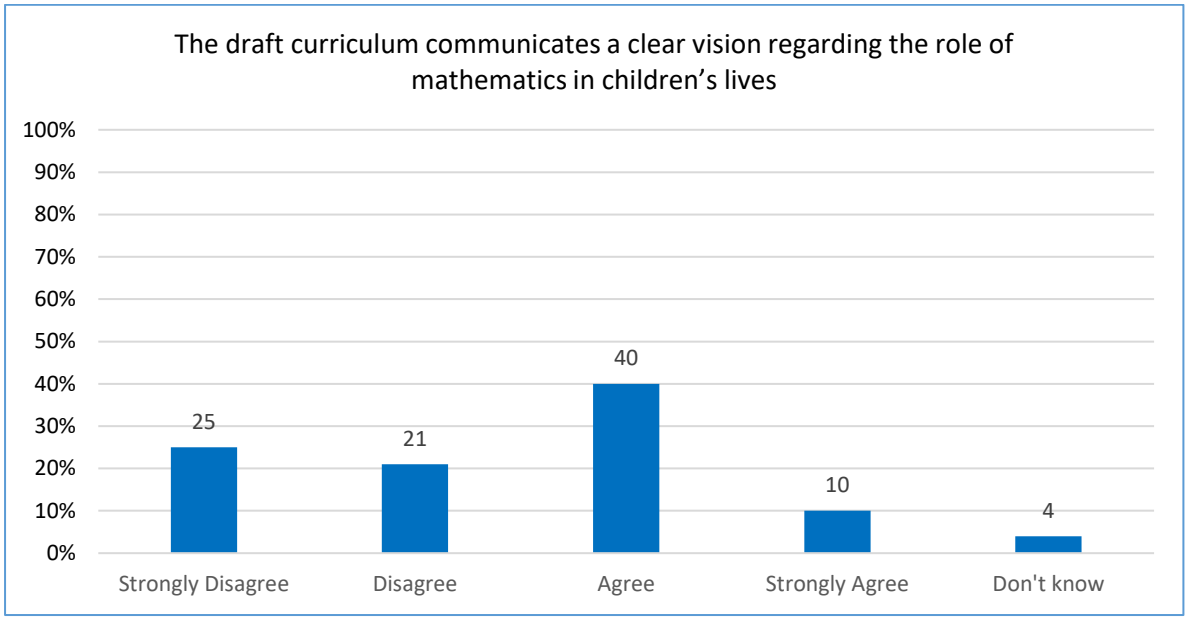
Just 186 respondents (17%) indicated their school size (where relevant). Of these, 58 (31% of 17%) reported teaching in schools with 201-300 pupils, while 46 (25%) taught in schools with 100-200 pupils. Just 34 respondents (18%) reported teaching in schools with 100 or fewer pupils.

Relatively small numbers of teachers responded to other questions seeking demographic data, including years of teaching experience (188 or 17% of respondents, including some who marked 'not applicable), whether or not they taught multi-grade classes (186 or 17%), whether or not they taught in a special school (186 or 17%), and whether or not they taught in a DEIS school (206 or 19%). A further question, which covered school type (vertical, Junior, Senior) and school gender composition, and which required participants to tick all that applied, received just one tick from most participants. Because relatively few participants completed key demographic questions, the responses of subgroups of respondents were not analysed.

Rationale for and aims of the new Primary School Mathematics Curriculum

At the outset, respondents were asked to indicate their view on whether the 'the draft curriculum communicates a clear vision regarding the role of mathematics in children's lives'. One half of respondents (50%) indicated that they 'strongly agreed' or 'agreed', while 46% 'disagreed' or 'strongly disagreed' (Figure 2). Four percent 'didn't know'.

Figure 2: Levels of agreement with the statement that the draft curriculum communicates a clear vision regarding the role of mathematics in children's lives - percentages of respondents

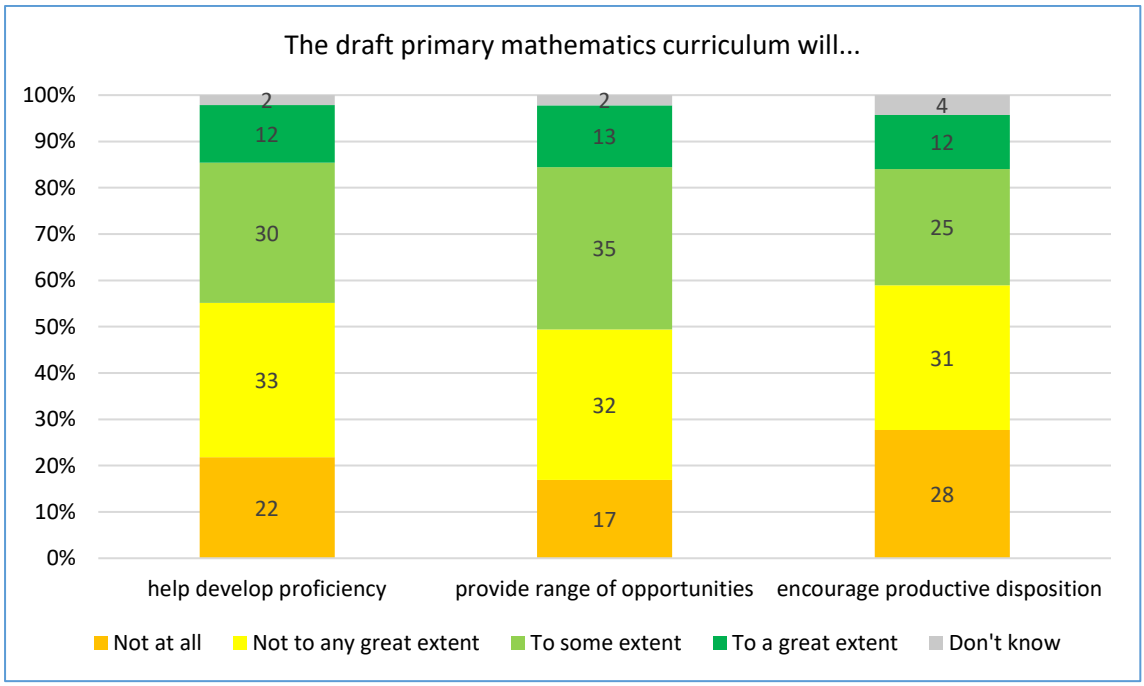


Just 12% of respondents believed that the draft primary curriculum would help children to develop mathematical proficiency 'to a great extent', while 30% believed it would help 'to some extent' (Figure 3). A majority (55%) believed it would not help 'to any great extent' or that it would not help at all.

Almost half of respondents (48%) believed that the draft primary curriculum would provide pupils with a range of opportunities to put their acquired learning into practice 'to some extent' or 'to a great extent'. Thirty-seven percent believed that that this would not happen 'to any great extent' or would not happen 'at all'.

Finally, 37% of respondents believed that the revised mathematics curriculum would encourage the development of a productive disposition towards mathematics 'to a great extent' or to 'some extent', while 59% believed that the curriculum would not encourage the development of such a disposition to any great extent or at all.

Figure 3: Perceptions of the extent to which the draft PMC can help to develop mathematical proficiency, provide children with a range of opportunities to put their acquired learning into practice, and encourage a productive disposition towards mathematics



Strands and elements of the draft Primary Mathematics Curriculum

Respondents were then asked how confident they felt using the *Learning Outcomes* for each strand in the draft curriculum (Figure 4). The distributions of responses were almost identical across the five curriculum strands, with between 37% and 42% of respondents agreeing 'to a great extent' or 'to some extent' that they would feel confident in using Learning Outcomes (Algebra, at 37%, was lowest, and Number and Shape & Space, at 42% were highest). Between 56% (Number, Shape & Space) and 60% (Algebra) would not feel confident 'to any great extent' or 'at all' in using the Learning Outcomes.

Respondents were asked to indicate their level of agreement with the statement that 'the specification is helpful in integrating learning across strands'. Thirty-seven percent 'strongly agreed' or 'agreed' that the specification is helpful in this regard, while 60% 'disagreed' or 'strongly disagreed' (Figure 5).

The first of three questions that specifically mentioned the curriculum elements asked respondents to indicate their level of agreement with the view that 'the elements are clearly explained'. Thirty-one percent 'strongly agreed' or 'agreed', while 67% 'disagreed' or 'strongly disagreed' (Figure 5).

The second question asked for levels of agreement on the view that 'the elements are visually represented in a clear way'. Here, 32% 'strongly agreed' or 'agreed', while 65% 'disagreed' or 'strongly disagreed'. The third statement was that 'the relationship between the Elements and the Learning Outcomes is clear'. Here, 26% 'strongly agreed' or 'agreed', while 71% 'disagreed' or 'strongly disagreed'.

Figure 4: Levels of confidence in using the Learning Outcomes for each strand in the draft PMC

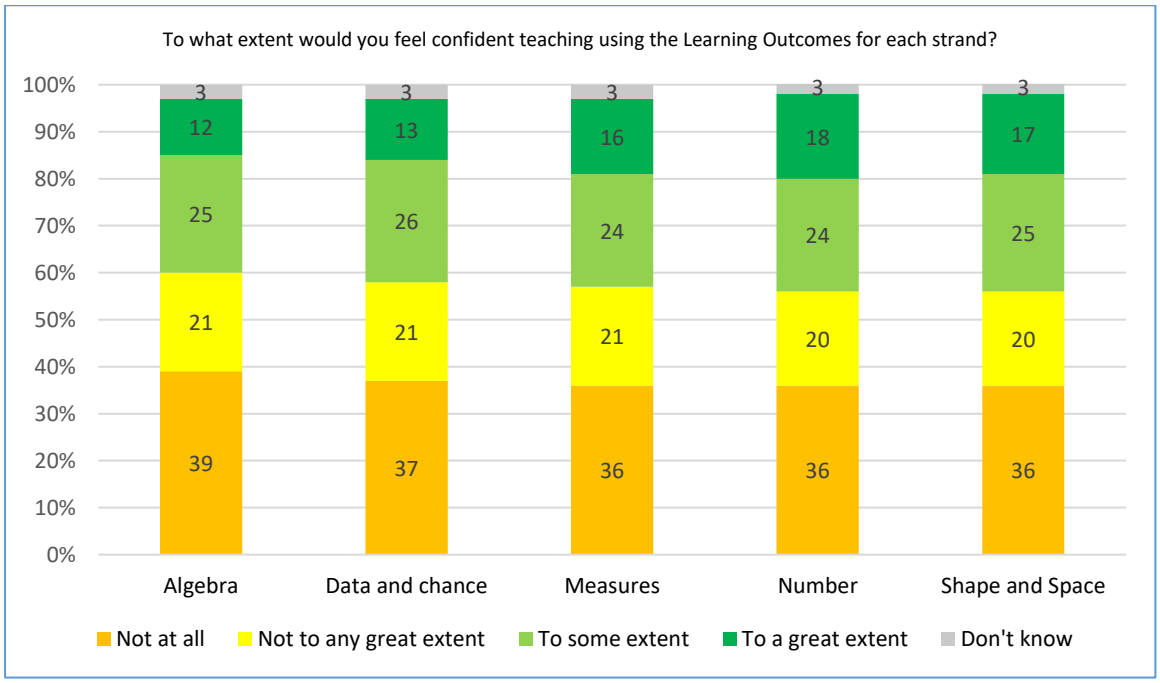
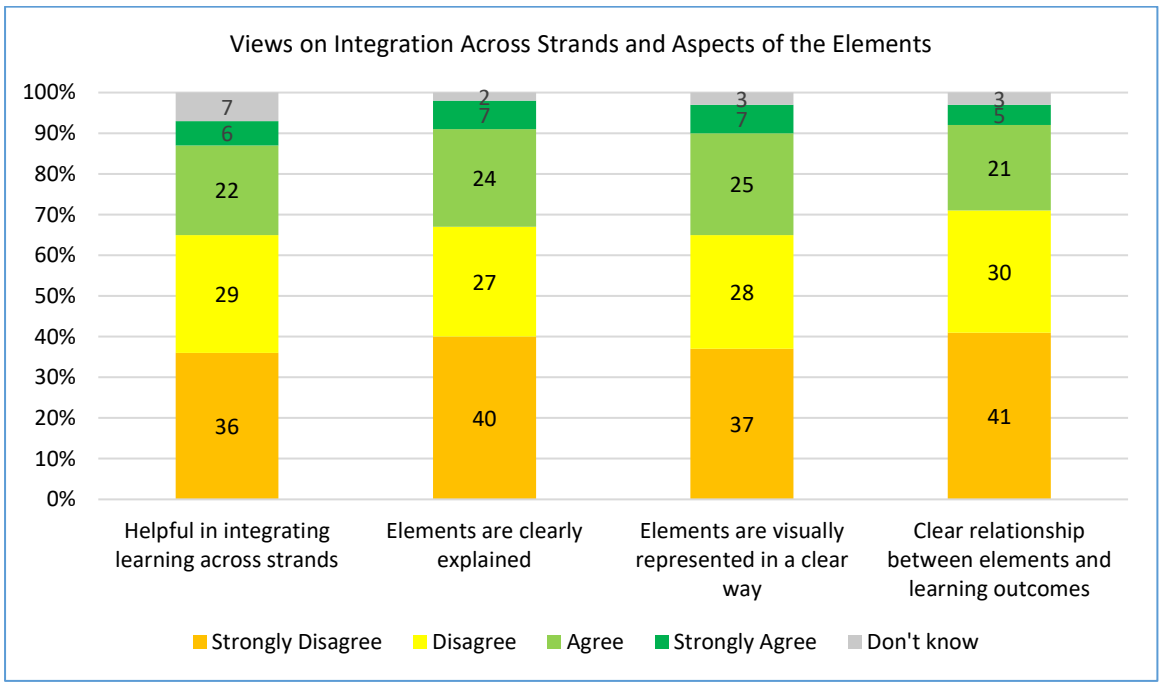


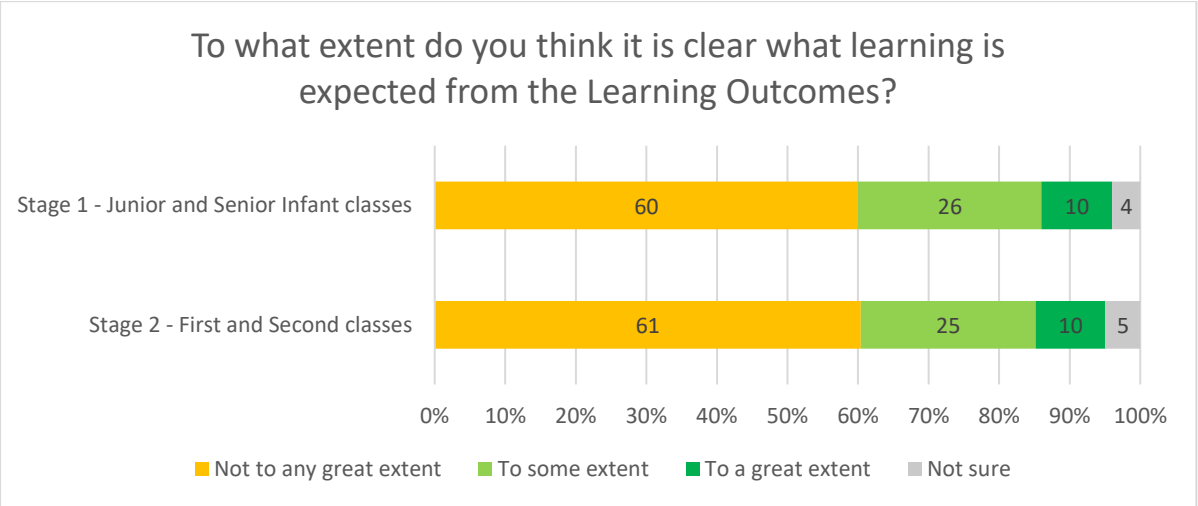
Figure 5: Levels of agreement with the view that the draft specification helps with integrating learning across strands, and with aspects of the elements



Overview of Learning Outcomes and Labels

Participants were then asked to respond to three questions about Learning Outcomes. The first asked them to indicate 'to what extent it is clear what is expected from the Learning Outcomes' for Stage 1 (Junior and Senior infants classes), and Stage 2 (First and Second classes). Response patterns for the two stages are almost identical (Figure 6). For both class bands, 10% of respondents reported that it was clear 'to a great extent' what was expected of the Learning Outcomes, while about one-quarter reported that it was clear 'to some extent'. Sixty percent reported that it was not clear 'to any great extent'. This suggests some difficulty among participants in their interpretation of Learning Outcomes.

Figure 6: Views on the extent to which what is expected from the Learning Outcomes for two class bands



The second question relating to the Learning Outcomes called on participants to indicate the extent to which they agreed with the statement 'The Learning Outcomes presented in the draft curriculum offer a suitable balance between mathematical knowledge and skills' in respect of each of five mathematics content areas. Agreement levels were quite similar across the five content areas, with between 29% (Algebra) and 33% (Number) 'strongly agreeing' or 'agreeing', and between 61% (Number) and 64% (Algebra) 'disagreeing' or 'strongly disagreeing' (Figure 7).

In the third question, participants were asked to indicate separately for Stage 1 (Junior and Senior Infants) and Stage 2 (First and Second Classes) their agreement with the view that the Learning Outcome stem, 'Through appropriately playful learning experiences, children should be enabled to' is appropriate. While 59% of respondents 'strongly agreed' or 'agreed' that the stem was appropriate for Stage 1, just 46% indicated similar levels of agreement in relation to Stage 2. This may reflect a view among respondents that playful learning experiences are a more appropriate context for teaching and learning mathematics at Stage 1, compared with Stage 2 (Figure 8). Over

one-third of participants 'disagreed' or 'strongly disagreed' that the stem was appropriate for Stage 1, while 46% expressed similar levels of disagreement in respect of Stage 2.

Figure 7: Levels of agreement with the view that the Learning Outcomes presented in the draft PMC offer a suitable balance between mathematical knowledge and skills for each of the five content areas

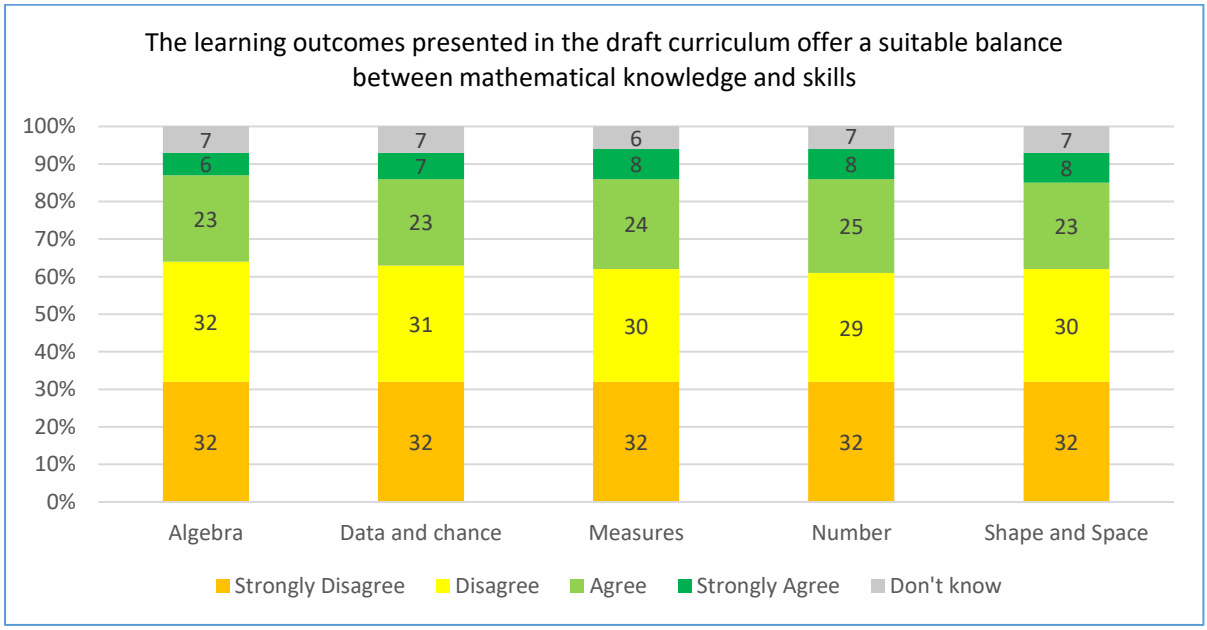
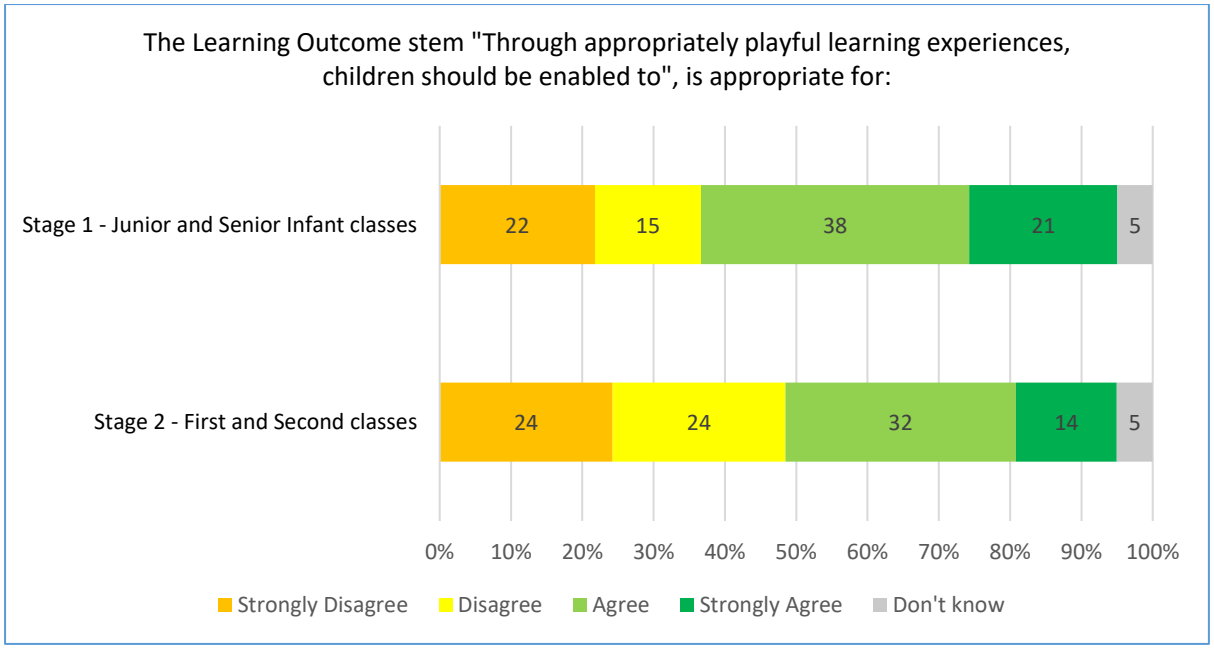


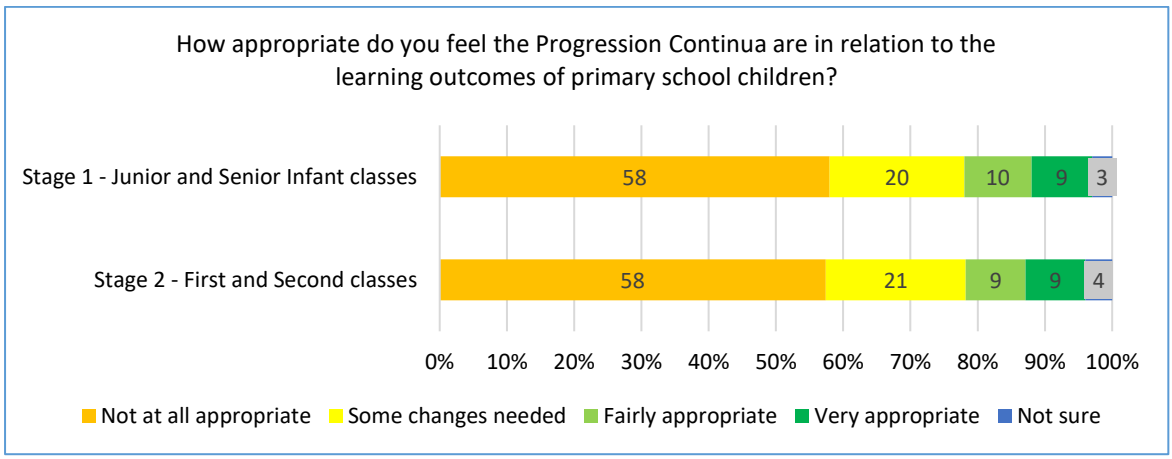
Figure 8: Levels of agreement with the view that the Learning Outcomes stem 'through appropriately playful learning experiences, children should be enabled to' is appropriate for i) Stage 1 and ii) Stage 2



Progression Continua and Milestones

First, participants were asked about the appropriateness of the Progression Continua in relation to the learning outcomes of primary school children at Stage 1 (junior and senior infant classes) and Stage 2 (first and second classes). Figure 9 summarises the outcomes, which are similar for Stages 1 and 2. About 20% of respondents felt that the Progression Continua were 'very appropriate' or 'fairly appropriate' in relation to the Learning Outcomes of primary school children at these stages. A further 20% rated the Continua as needing some changes, while almost three-fifths felt that the Progression Continua were 'not at all appropriate'.

Figure 9: Perceptions of the appropriateness of the Progression Continua in relation to the Learning Outcomes of children at Stage 1 and Stage 2



Following this, participants were asked to indicate their level of agreement with the statement that 'the Progression Continua provide enough detail to deliver rich mathematical learning experiences for all learners in each of the strands'. Figure 10 shows their responses for each of the five strands in the draft curriculum. Respond patterns were broadly similar across content strands. Just under one-fifth 'strongly agreed' or 'agreed' that the Progression Continua provided sufficient detail to deliver rich mathematical experiences for all learners, for each strand. Just under one-quarter 'disagreed', while about 55% 'strongly disagreed'. Just 3-4% did not know.

Participants were then invited to identify the milestone that best located the majority of children's mathematical learning and development at the end of senior infants. About 600 participants (54%) responded in respect of each content strand. Again, response patterns were quite similar across content strands (Figure 11). Between 30% of respondents (Algebra) and 33% (Data & Chance) indicated that a majority of children would be best located at Milestones a or b at the end of senior infants. Between 32% (Data & Change) and 36% (Measures) selected Milestone c, while 13-14% selected Milestone d. Ten percent or fewer selected Levels e, f or g.

Figure 10: Levels of agreement with the statement that the Progression Continua provide enough detail to deliver rich mathematical learning experiences for all learners in each strand

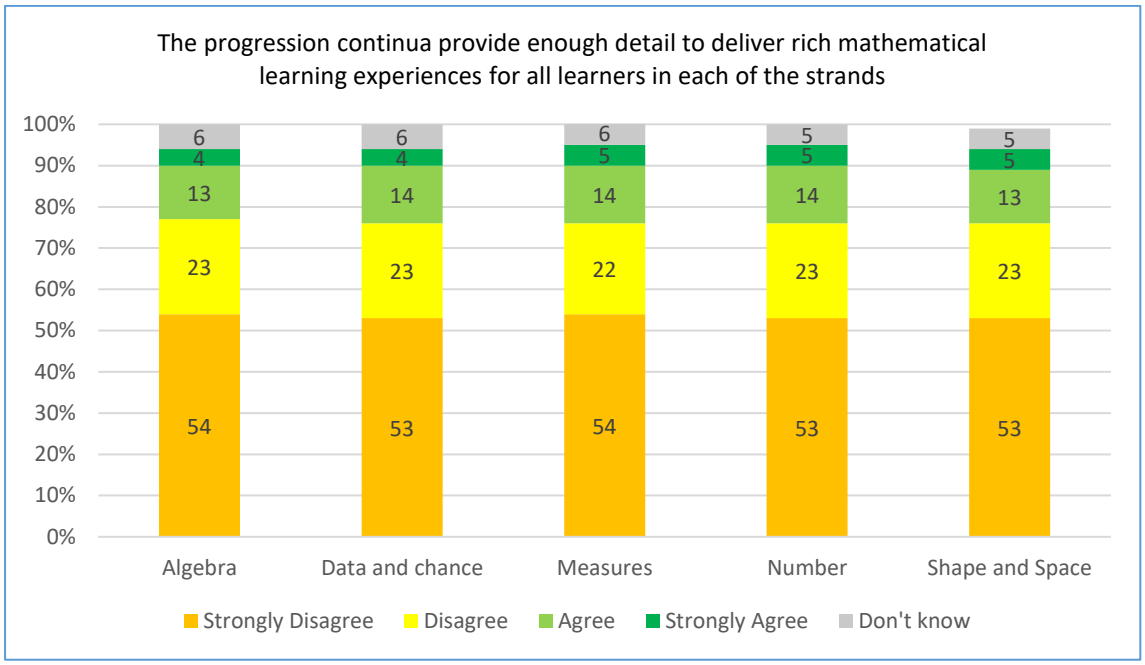
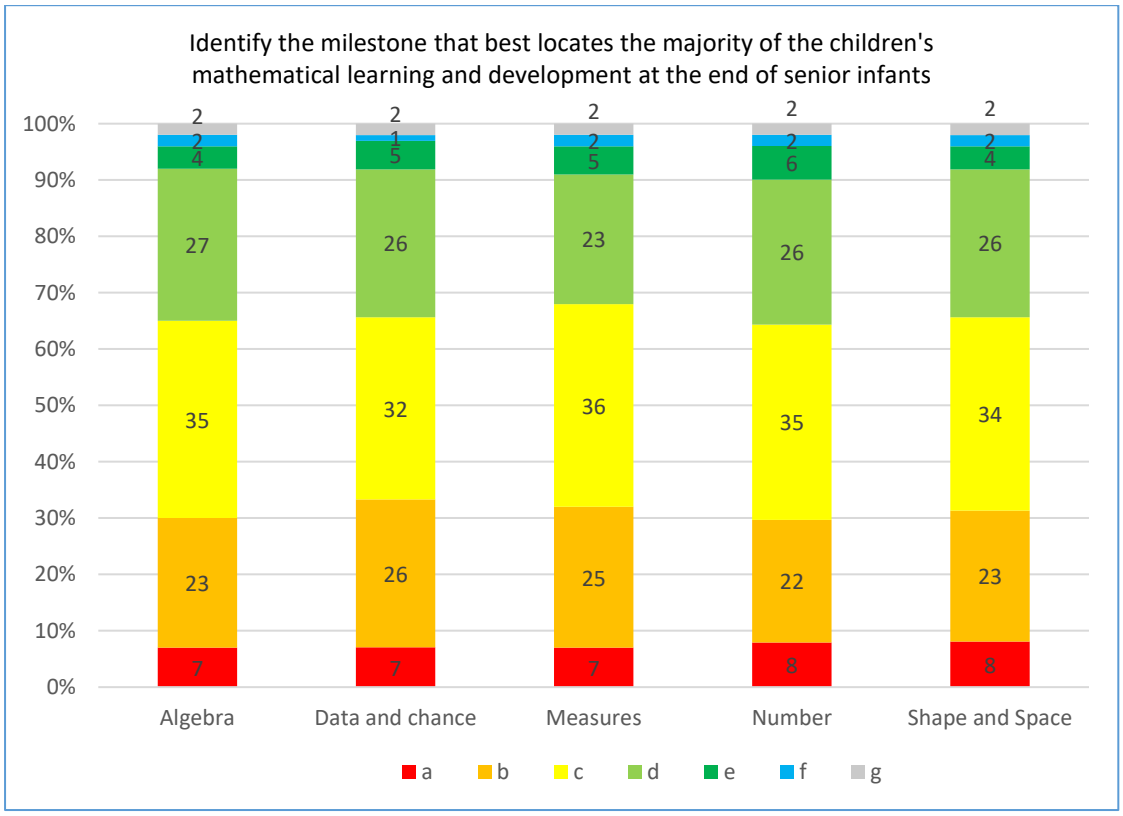
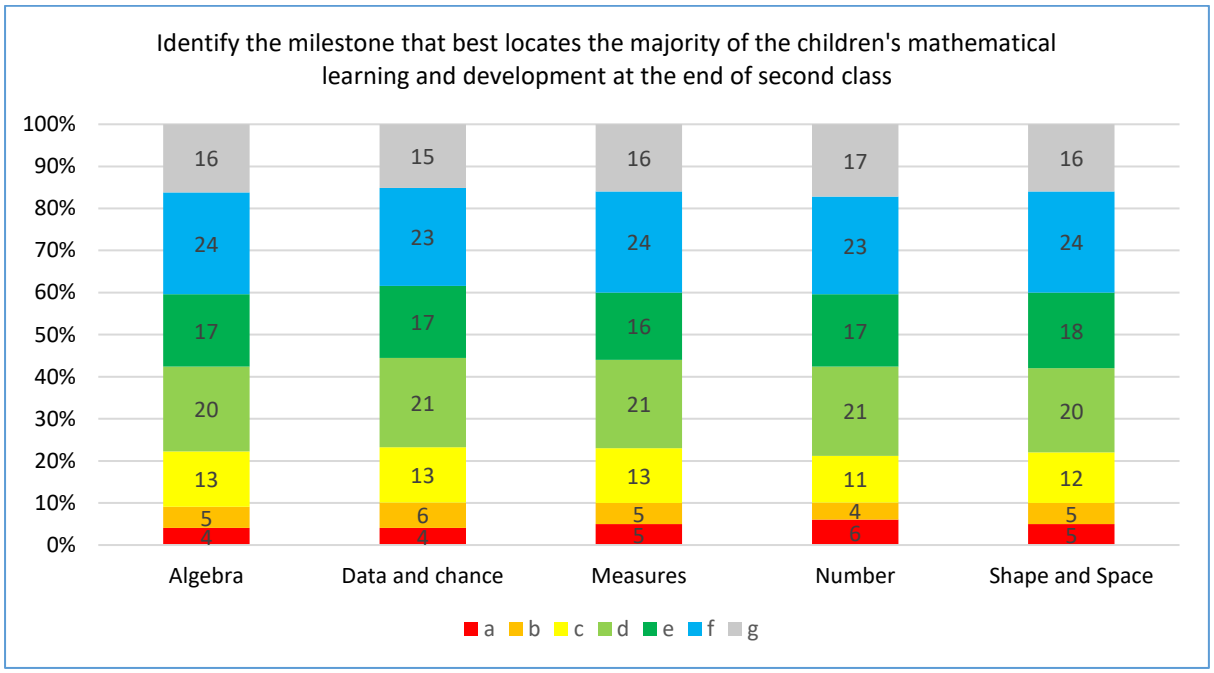


Figure 11: Estimates of the milestone that best locates the majority of children's mathematical learning at the end of Senior Infants



Participants were then asked to engage in the same activity in respect of pupils at the end of second class. Fifty-five percent of participants responded. Responses were more distributed on this occasion, which might be expected, given that children would have been expected to have made more progress at the upper end of the continua. Again, percentages were broadly similar across content strands (Figure 12). Just 10% of respondents indicated that a majority of children's learning was located at milestones a and b at the end of second class, while a further 11-13% selected Milestone c. Between 20-21% selected Milestone d, while 16-18% chose Milestone e. About one-quarter of respondents (23-24%) selected Milestone f while one-sixth (15-17%) selected the highest Milestone, g.

Figure 12: Estimates of the milestone that best locates the majority of children's mathematical learning at the end of second class



The next question asked respondents to indicate how easy it would be to locate the learning of the majority of children in their class on the Progression Continua for each strand. Sixty-two percent of participants responded to this question. Again, responses were broadly similar across content areas. Between 21% (Algebra, Measures) and 24% (Number) indicated that they could locate 'most children' or 'all children' on the continua. Between 29% (Number and Measures) and 32% (Shape & Space) said they could 'only locate 'some children' on the continua, while 37% (Shape & Space) to 39% (Algebra, Data & Chance, Measures) said that they didn't think they could apply the milestones in their class. About one-tenth of respondents indicated that the question was not applicable, presumably because they were not familiar with the performance or development of pupils at Stages 1 and 2.

After this, participants were asked to evaluate the appropriateness of Milestone 'a' for two groups of children with special education needs – those with severe or profound educational needs, and those with moderate educational needs. Just over 60% of participants answered each question. Twenty-one percent of respondents rated Milestone 'a' as 'very appropriate or 'fairly appropriate' for children with moderate educational needs, while 19% viewed it as similarly appropriate for children with 'severe or profound' educational needs (Figure 14). Thirty-seven percent of respondents noted that 'some changes' were required for children with moderate needs, while 32% responded similarly in respect of children with severe or profound needs. Finally, 42% considered Milestone 'a' to be 'not at all appropriate' for children with moderate needs, and 49% for children with severe or profound needs.

Figure 13: Reflections on locating the learning of a majority of children in a class on the Progression Continua across the different strands

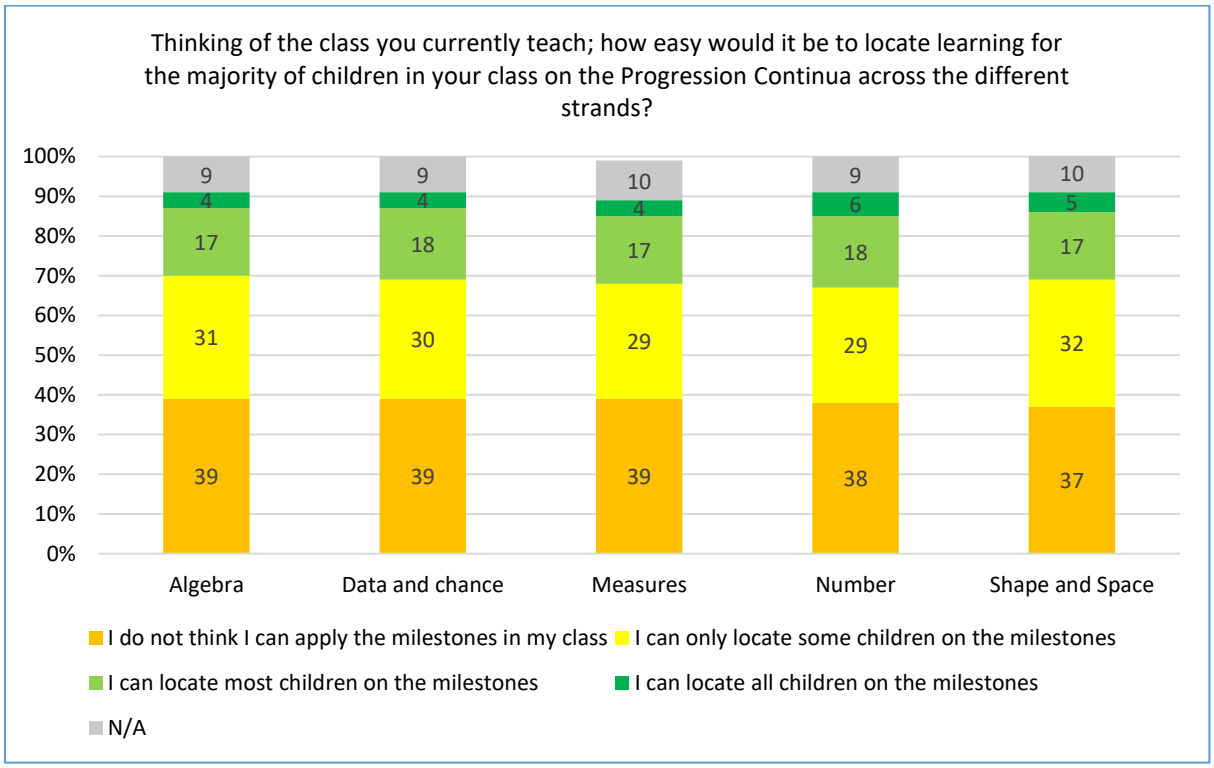
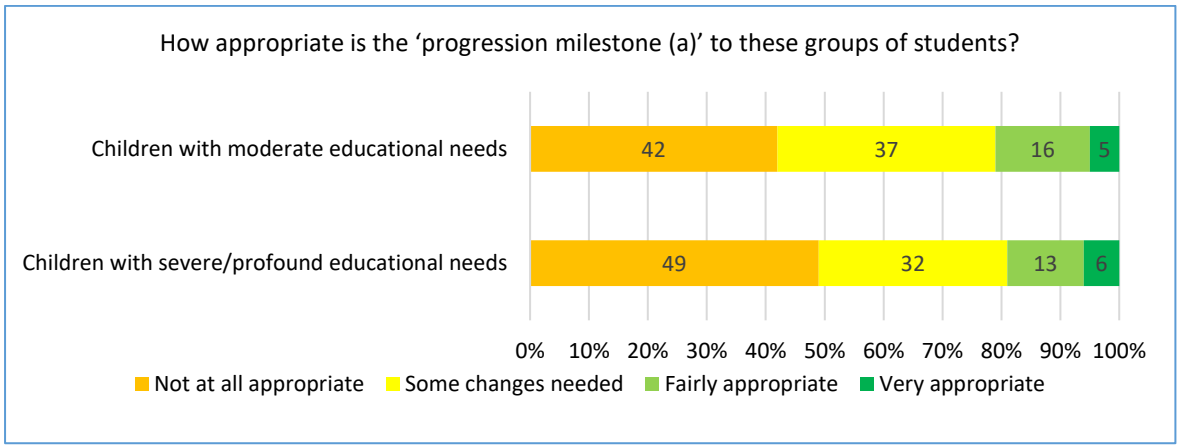
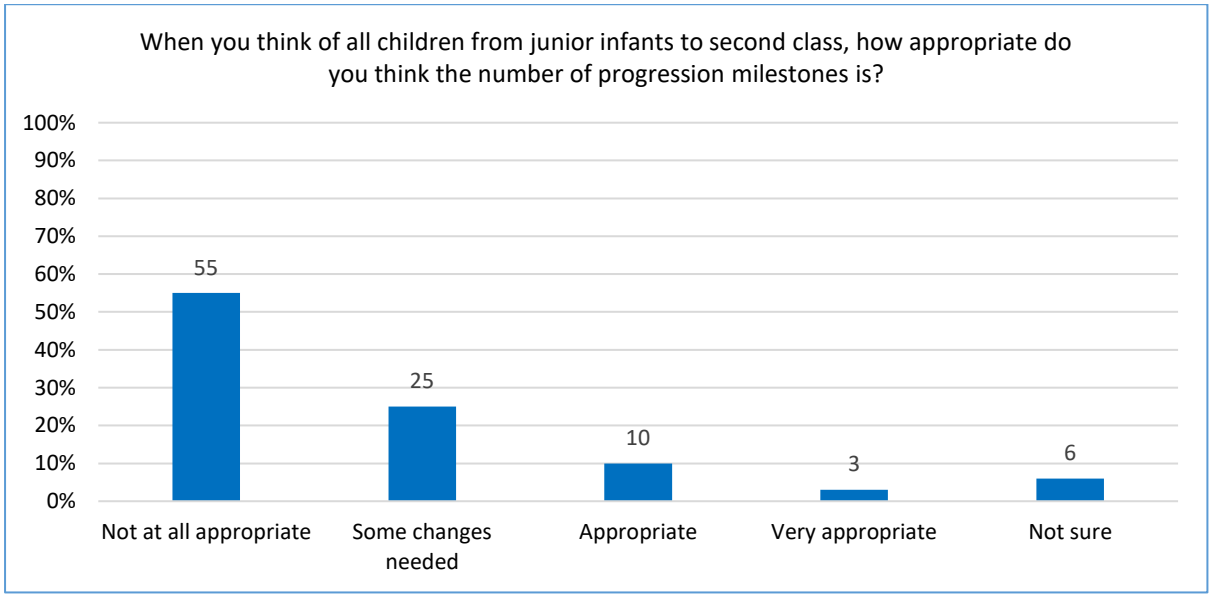


Figure 14: Appropriateness of the progression Milestone 'a' for i) children with severe/profound educational needs, and ii) children with moderate educational needs



After this, participants were asked to indicate, in respect of all children in junior infants to second class, how appropriate the number of milestones is. Just over 60% provided an answer. Thirteen percent viewed the number of milestones as 'very appropriate' or 'appropriate', while one-quarter thought that 'some changes' in the number were needed (Figure 14). A majority (55%) reported that the number of milestones was 'not at all appropriate'.

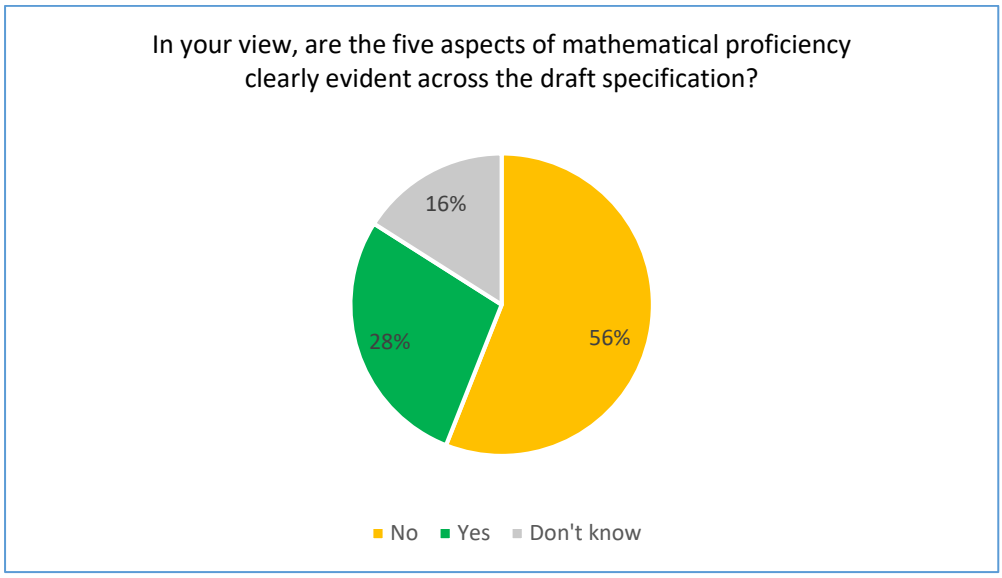
Figure 15: Appropriateness of the number of progression milestones, taking all children from junior infants to second class into account



Aims of the draft Primary Mathematics Curriculum

Respondents were then asked if they felt that the five aspects of mathematical proficiency were clearly in evidence across the draft specification. Sixty-five percent of participants responded (Figure 15). Twenty-eight percent of respondents indicated 'Yes', while 56% indicated 'No'. About one-sixth said that they didn't know.

Figure 16: Respondents' perceptions whether or not the five aspects of mathematical proficiency are clearly evident across the draft specification

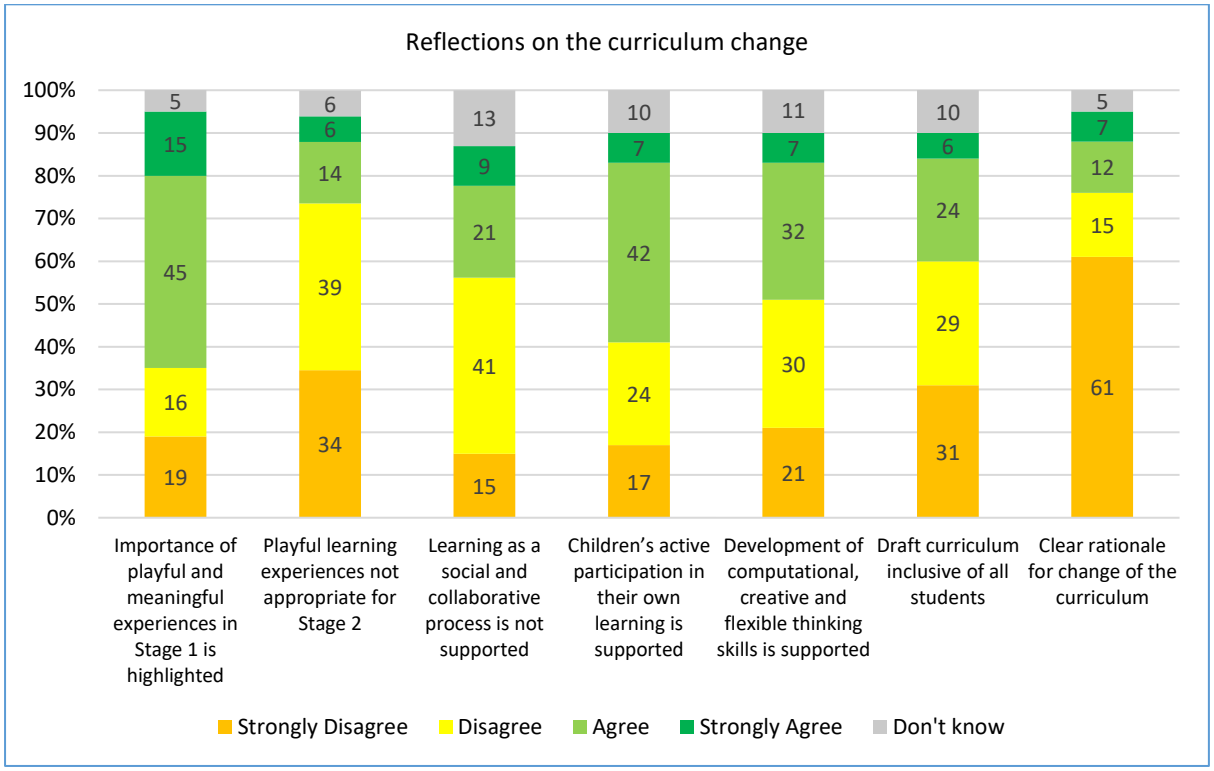


Reflections on curriculum change

First, participants were asked to indicate their level of agreement with six statements about the draft curriculum. Sixty percent responded. Among these, 60% 'strongly agreed' or 'agreed' that that the draft curriculum highlights the importance of playful and meaningful experiences for children's learning in Stage 1 (junior and senior Infants). Thirty-five percent 'disagreed' or 'strongly disagreed', while the remainder 'didn't know'. Twenty percent of respondents indicated agreement[6] with the statement that playful experiences were not appropriate for children's learning at Stage 2 (First and Second classes), while almost three-quarters indicated disagreement. Thirty percent indicated agreement with the view that the draft curriculum does not support learning as a collaborative and social process, while 56% indicated disagreement. Almost half (49%) indicated agreement with the statement that the draft curriculum supports children's active participation in their own learning of mathematics. Forty-one percent indicated disagreement. Almost four in ten (39%) indicated agreement with the view that the draft curriculum supports the development of computational, creative and flexible thinking skills, while 51% indicated disagreement. Thirty percent indicated agreement with the view that the draft curriculum is inclusive of all students, while 60% indicated disagreement. Fewer than one-fifth (19%) indicated agreement with the view that the rationale for changing the curriculum is clear, while 61% indicated disagreement.

[6] 'Indicates agreement' means they 'strongly agreed' or 'agreed'. 'Indicates disagreement' means 'disagreed' or 'strongly disagreed'.

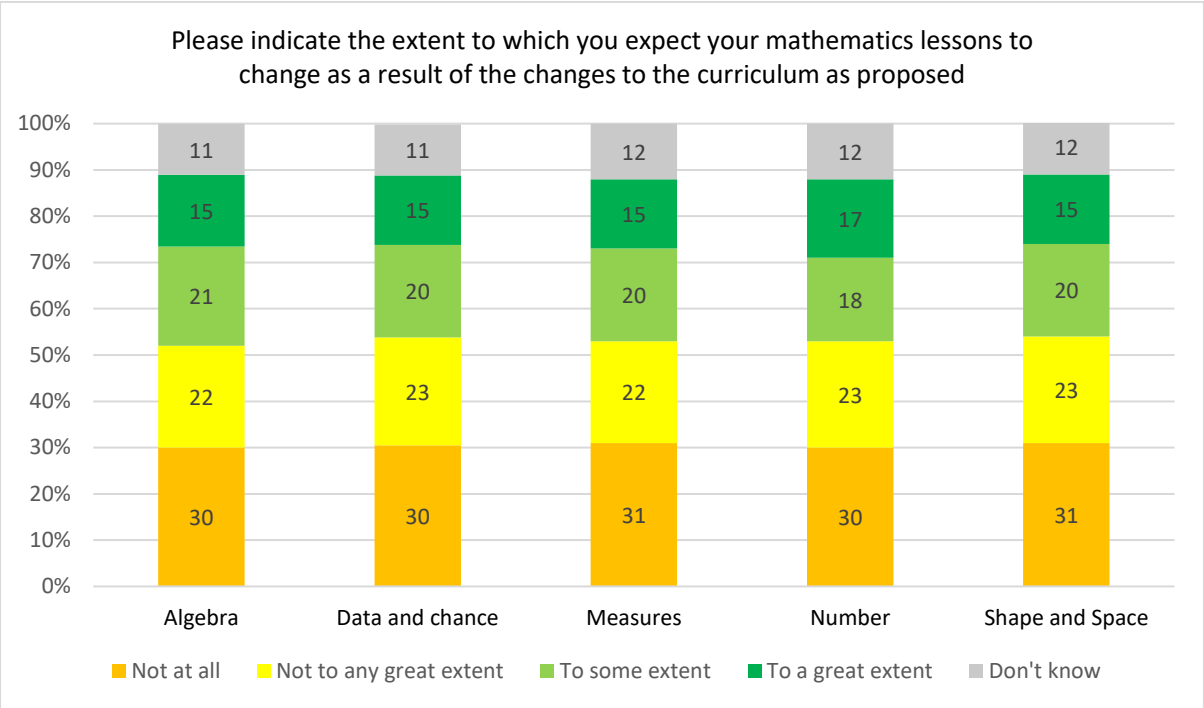
Figure 17: Levels of agreement with statements about curriculum change



Hence, the most strongly supported positive statements relate to the view that the curriculum highlights the importance of playful and meaningful experiences in Stage 1, that children's active participation in their own learning is supported, and, albeit to a lesser extent, that the development of computational, creative and flexible thinking is supported. On the other hand, there is relatively disagreement with the view that the draft curriculum is inclusive of all students, and that there is a clear rationale for curriculum change. It is also clear that a strong majority of respondents disagree with the view that playful learning experiences are not appropriate for children's learning in first and second classes.

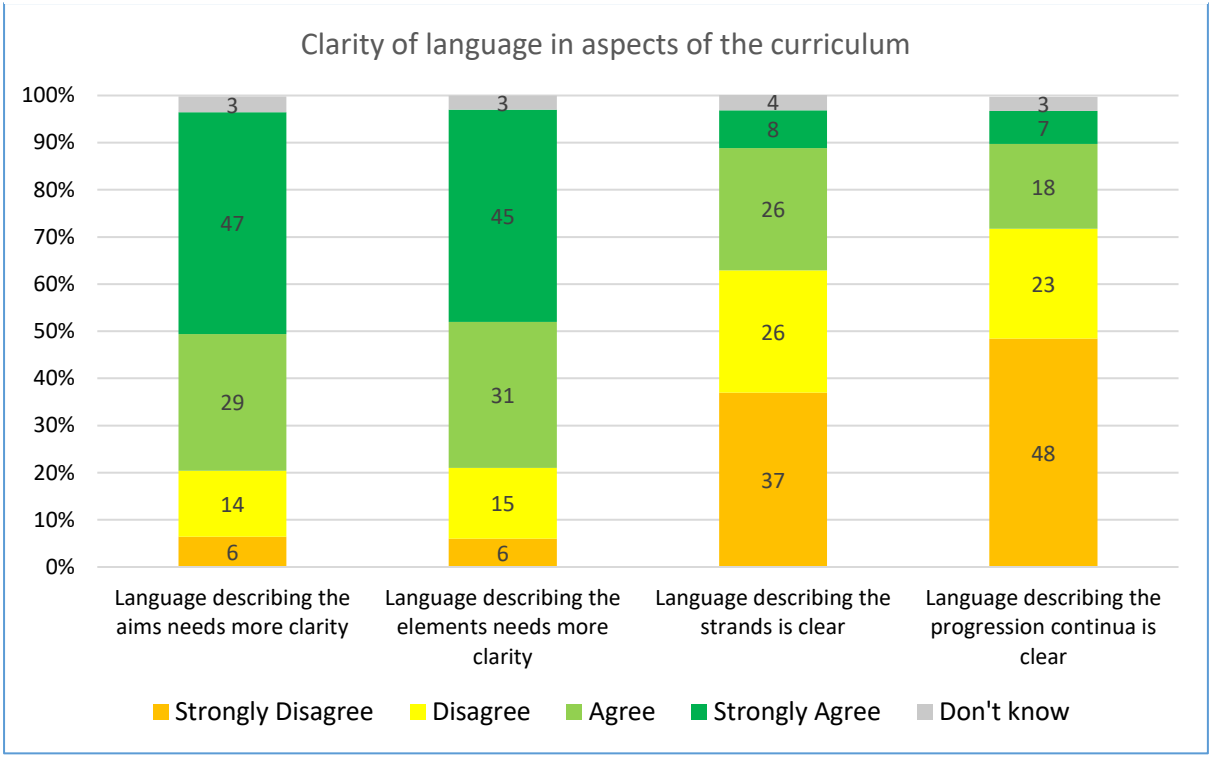
Next, participants were asked to indicate, in respect of each mathematics content area, to what extent they expected mathematics lessons to change as a result of proposed changes to the curriculum. This question was answered by 649 participants (59%). Again, response patters were broadly similar across content areas, with 35-37% expecting change to occur 'to a great extent' or 'to some extent'. On the other hand, 52-54% expected that change would not occur 'to any great extent' or 'at all'. Hence, among respondents, more (just over half) expected no great change, while over a third expected a least some change. Between 11-12% 'did not know'.

Figure 18: Extent to which mathematics lessons are expected to change as a result of proposed changes to curriculum by content strand



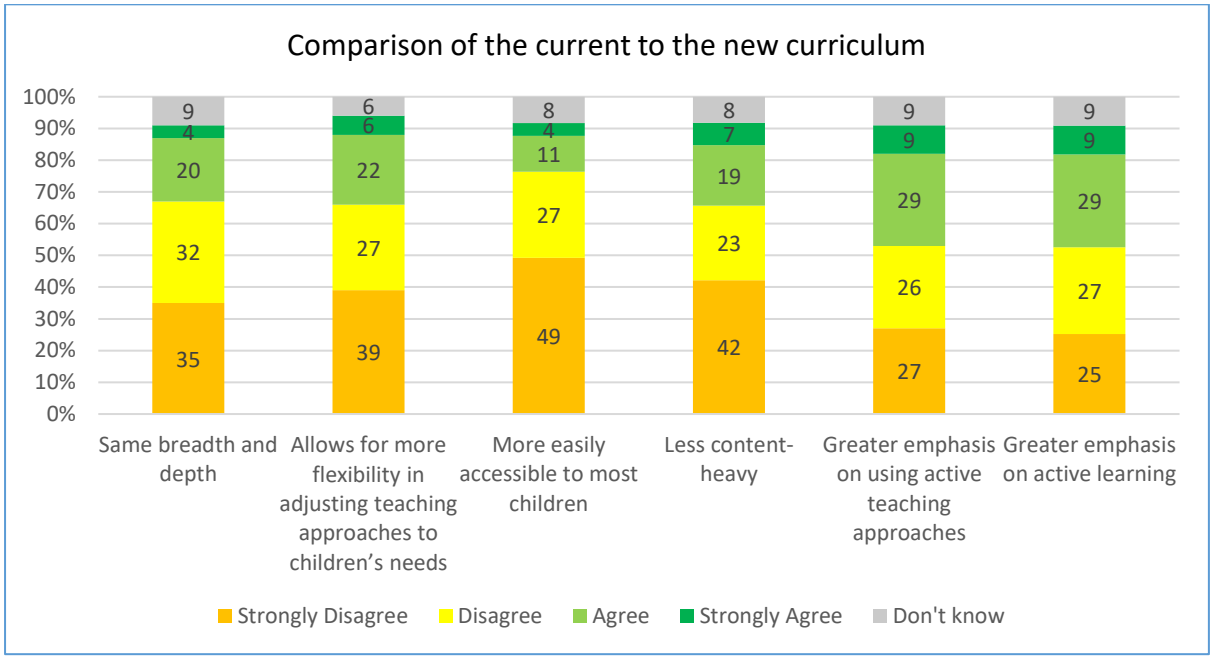
Participants were then asked to evaluate the language used in the draft curriculum along four dimensions – the aims, the strands, the elements and the Progression Continua. The question was answered by 653 participants (59%). Over three-quarters of these (76%) 'strongly agreed' or 'agreed' that the language describing the aims needs more clarity, while 20% 'disagreed' or 'strongly disagreed (Figure 18). Similar proportions indicated agreement and disagreement with the view that the language used in describing the strands is clear – 76% and 21% respectively. Just over one-third (34%) indicated agreement with the view that the language used in describing the elements needs more clarity, while 63% indicated disagreement. Similarly, 41% indicated agreement with the view that the language used in describing the Progression Continua is clear, while 71% indicated disagreement.

Figure 19: Levels of agreement on clarity of language used in describing the aims of the curriculum, content strands, elements and Progression Continua



In a final question on reflection on curriculum change, participants were asked to indicate their level of agreement with six statements comparing the current (1999) curriculum with the new draft curriculum in mathematics. Responses were provided by 656 participants, or 59%. Just under one-quarter of respondents (24%) indicated agreement with the statement that the draft curriculum has the same breadth and depth as the 1999 curriculum, while two-thirds (67%) indicated disagreement (Figure 19). Twenty-eight percent indicated agreement with the statement that, compared to the 1999 curriculum, the draft curriculum allows for more flexibility in adjusting teaching approaches to children's needs; 66% indicated disagreement. In response to the statement that 'compared to the 1999 curriculum, the draft curriculum is more accessible to most children', 15% indicated agreement, while just over three-quarters (76%) indicated disagreement. Twenty-six percent indicated agreement with the view that 'the draft curriculum is less content heavy than the 1999 curriculum', while 65% indicated disagreement. Thirty-eight percent indicated agreement with the view that the draft curriculum has a greater emphasis on using active teaching approaches, while just over half (53%) indicated disagreement. Finally, 39% indicated agreement with the view that 'compared to the 1999 curriculum, the draft curriculum has a greater emphasis on active learning', while 52% indicated disagreement.

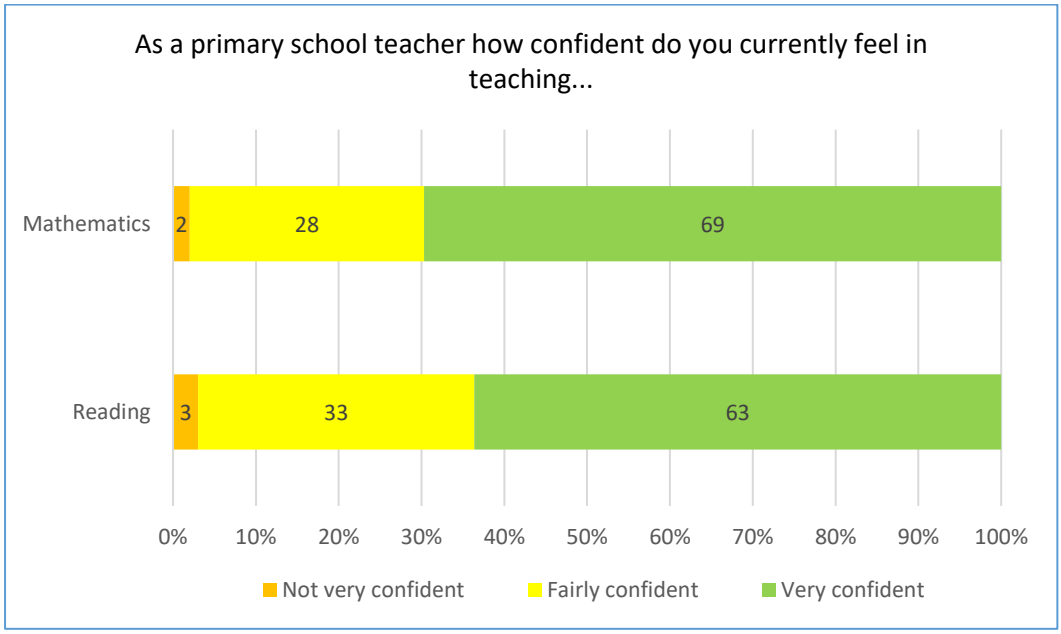
Figure 20: Levels of agreement with statements comparing the current (1999) curriculum with the draft PMC



Teacher confidence in teaching mathematics

Participants were asked to indicate how confident they currently feel in teaching mathematics and reading. Just 184 (17%) provided a response. Among these, 69% indicated that they were 'very confident' in teaching mathematics, while 63% indicated a similar level of confidence in teaching reading (Figure 20). Twenty-eight percent said they were 'fairly confident' teaching mathematics, while 33% reported a similar level of confidence with respect to the teaching of reading.

Figure 21: Levels of confidence among primary teachers in currently teaching mathematics and reading



As a follow-up, teachers 'not feeling confident' (2% in the case of mathematics, and 3% in the case of reading) were asked to give reasons. All three teachers who had marked 'not very confident' for mathematics provided reasons. These was a disconnect between what the respondent felt to be effective, and current educational trends; a lack of training in college (in the 1980s); and a high workload as a teaching principal, coupled with a corresponding lack of time to keep abreast of new initiatives. Fourteen respondents who rated themselves as 'fairly confident' in teaching mathematics also provided reasons for their lack of confidence, including a large class size (making it difficult to implement active learning methods), too much content to cover, lack of resources and lack of confidence in their own mathematical ability.

In a separate open-ended question, participants were asked to give details of any mathematics CPD or training that had positively affected their teaching practice. In all, 130 teachers responded to this question, and listed 170 courses or course providers (see Table 2). There is overlap across courses/categories, as responses often did not provide sufficient information to allow for an unambiguous categorisation. The most frequently-mentioned courses/providers included:

- Other (22% of courses) – courses or providers mentioned once or twice; these included courses on *Aistear*, elective college courses, courses taken by teachers when they worked abroad, and courses on Lego, multi-grade teaching, Singapore maths, peer teaching and team teaching. Sometimes, individual or group providers were mentioned.
- PDST (19% of courses): several PDST courses relating to mathematics were mentioned, including problem solving, *Aistear*, number sense, integrating mathematics and science, and numeracy support at school level
- Ready, Steady, Go-Maths (14%), delivered by the PDST (but not included under PDST above)
- Mata sa Rang /Maths Recovery (18%)
- Summer courses (9%), with some respondents mentioning specific courses and specific providers. Providers included the Irish National Teachers Organisation and CPD College, an online provider.
- Post-graduate courses (6%), including diplomas in special education needs, masters' degrees in mathematics education and doctoral programmes.

Next, teachers were asked to consider the NCCA's support material (toolkit, examples, podcasts) and were asked to indicate in writing what form of support they preferred for the proposed changes to the mathematics curriculum. In all, 121 respondents offered suggestions. However, many of these

did not refer to NCCA support materials. Instead, they referenced issues with the draft curriculum document, such as a perceived need for Learning Outcomes for each class level, criticisms of the Progression Continua, critiques of existing textbooks, and calls for the provision of face-to-face in-service. When these responses, most of which are outside of the NCCA's remit, were set apart, 66 valid responses were available. These were provided by 6% of all (1,104) respondents to the questionnaire. Table 3 summarises these responses. The most frequent valid response (51% of respondents) was 'multiple-resources', with some respondents listing both specific resources (toolkits, examples etc.) and requests for specific forms of CPD (e.g., face-to-face training, school-based support). The 'resources' category (7%) included concrete materials and unspecified 'practical resources'. The 'other' category included teacher guidelines similar to those produced in 1999 and templates for multi-grade classes.

Table 2: Mathematics CPD or training that positively affected practice

Topic/Area	Number of Courses	Percent of Courses
Other	37	22
PDST	33	19
Mata sa Rang/Maths Recovery	30	18
Ready, Steady, Go Maths	23	14
Summer courses	16	9
Post-graduate Studies	11	6
Numicon	9	5
IZAK9	4	2
Own Research	4	2
ICT and Maths	3	2
Totals	170	100

Table 3: Forms of NCCA support material preferred by respondents

Resource	Number of Respondents	Percentage of Respondents
Multiple Resources	35	51
Exemplars	13	19
Toolkit	9	13
Resources	5	7
Podcast/video	4	6
Other	3	4
Totals	69	100

Final reflections for all

An open-ended question at the end of the questionnaire invited participants to add any comments they wished to make in relation to the introduction of the new primary school curriculum in mathematics. In all, 463 of 1,104 respondents (42%) provided a total of 1,004 unique comments, based on taking the first three unique comments offered by these respondents. Topics were coded according to the main topic addressed. No respondent was assigned the same code more than once. Table 4 provides a breakdown of comments by topic. It should be noted that 16% of comments (65 in all) were either positive (for example, endorsing some aspect of the curriculum document such as playful or active learning) or neutral (for example, a call for the inclusion of a specific aspect of content or learning outcome or a suggestion to use a particular term such as structured play for playful).

The topics most frequently raised in final reflections were Progression Continua/Milestones (where respondents were generally negative) and the 1999 curriculum (which respondents generally argued was working well and did not need to be changed). Comments under these categories comprised 22% of all comments, with 25% of respondents commenting on the Progression Continua/Milestones and 24% on the 1999 curriculum (some of these commented on both). Other topics referred to by at least 5% of respondents (each comprising at least 3% of all comments) were:

- Paperwork (25% of respondents): the Progression Continua in particular were viewed as contributing to increased levels of paperwork/recording and reduced teaching time.
- the Primary Language Curriculum (24%): respondents reported that they or their colleagues struggled with the Progression Continua for English (with oral language often mentioned) and expected to struggle with the mathematics curriculum as well.
- Language/lack of clarity (14%): respondents raised concerns about the complexity of the language in the draft curriculum document, or with a broader lack of clarity about what they would be asked to teach. A typical response under this category was that the draft curriculum was 'vague'.
- Workload (51%): respondents were concerned about an increase in workload for teachers, with insufficient time to plan learning activities; this topic overlaps with the earlier category of paperwork, though comments categorised as workload-related did not specifically mention paperwork.
- Other (14%): based on responses that did not fit into any other category, these ranged from positive comments (I fully support the revised curriculum, with its emphasis on understanding) to neutral (drop down menus needed for Progression Continua) to negative (not fit for purpose).
- Structure (11%): respondents expressing concern that the curriculum lacked a clear statement of the Learning Outcomes for each class level. Responses under this category were more explicit than those under the 1999 curriculum, which typically argued for the retention of the 1999 curriculum on the basis that it was working well.
- International context (10%): respondents typically argued that the structure and/or format of the draft PMC was similar to curricula implemented in Scotland, England or further afield, that had been discredited because they did not raise achievement. Some referred to recent increases in performance in international assessments by pupils in Ireland as a reason not to change anything.
- Planning (10%): respondents typically called for the provision of templates to facilitate the planning process, or pointed out that such templates are not yet available.
- Learning Outcomes (9%): respondents typically criticised the Learning Outcomes in the draft document, and called for fewer or clearer outcomes. Several teachers referred to Learning Outcomes as objectives (a carry-over from the 1999 curriculum), or equated Learning Outcomes

with milestones, arguing that there are more rather than fewer outcomes, compared with the 1999 curriculum.

- CPD (7%): some respondents noted that no CPD had yet been provided on the mathematics curriculum, others called for intensive CPD, and still others critiqued the CPD provided in conjunction with the implementation of the Primary Language Curriculum.
- Consultation (6%): some respondents argued that there had been insufficient consultation with teachers on the development of the draft PMC; others were critical of the fact that just three consultation sessions were held and called for more. Under a related theme (NCCA), the curriculum developers were criticised as being 'out of touch' with the reality of classroom life.
- Resources (6%): respondents called for a broad range of resources to be provided, including human resources (more support teachers, classroom assistant) and teaching resources, additional teaching time, and practical resources and mathematical equipment.
- Teaching and learning (6%): respondents generally called for a stronger focus on teaching and learning in the curriculum document, and, by implication, less emphasis on assessment (via the Progression Continua and Milestones). Some respondents praised the emphasis on playful learning, the focus on real-world applications and the emphasis on collaborative learning (though a few respondents argued that these were happening already in schools).
- Content/strands (4%): while some respondents expressed disappointment with the content (or lack of it, as they saw it), others praised the content (for example, rotation and tessellation under Shape & Space) or suggested adjustments (for example, the provision of additional detail on what is intended by transformation). One commented that the structure of 10 was discussed before the structure of 5, and that the structure of 20 was missing. Another sought clarification on whether units or ones should be used in discussing place value. Yet another called for dedicated early learning outcomes.
- Style (4%): respondents typically critiqued the draft curriculum document as not being user friendly (e.g., pages of Progression Continua) or accessible.

Table 4: Topics of comments provided by respondents

Topic	Number	% of all comments	% of respondents
Progression Continua/Milestones	114	11	25
1999 Curriculum	113	11	24
Paperwork	72	7	16
Primary Language Curriculum	65	6	14
Language/clarity	65	6	14
Other	64	6	14
Workload/time	51	5	11
Structure	49	5	11
International context	46	5	10
Planning	45	4	10
Learning Outcomes	41	4	9
CPD	34	3	7
Consultation	30	3	6
Resources	29	3	6
Teaching and Learning	27	3	6
NCCA	18	2	4
Content/Strands	17	2	4
Style	17	2	4
Rationale/evidence base	13	1	3
Implementation	12	1	3
Assessment	11	1	2
Multi-grade classes	10	1	2

Elements	9	1	2
Special education needs	8	1	2
Standards	8	1	2
Differentiation	7	1	2
Standardised tests	6	1	1
Parent perspective	4	0	1
Questionnaire	4	0	1
Aistear	3	0	1
Breadth	3	0	1
Coding	3	0	1
Textbooks	3	0	1
Value for Money	3	0	1
Totals	1004	100	---

In commissioning the analysis, the NCCA suggested four broad themes around which to organise the qualitative findings from the study. The themes were: Accessibility, Usability, Support Materials, and Other. Some topics, such as Language/clarity and Resources, map directly onto the first three broad themes. Others, such as the 1999 curriculum, and the Primary Language Curriculum, belong to the 'other' theme.

Accessibility (by Teachers and Pupils)

The topics of Content/Strands, Elements, Language/Clarity, International Context, Other, Structure, Style, Progression Continua, Rationale and Learning Outcomes all relate to accessibility by teachers, while the topics of Differentiation relates to inclusivity of pupils. As noted above, a small proportion of respondents offered positive or neutral observations based on these topics, while a majority offered negative comments. Positive and neutral comments include:

- Curriculum content is good (Content/Strands).
- The expansion of the Strand 'Spatial Awareness and location' is very good. The expansion of rotational symmetry and tessellations is good at 1st and 2nd class (Content/Strands).

- Not sure what is meant by the ‘effects of shape movements’ (Content).
- Glad to see focus on skills development in Maths-why are these referred to as "elements"? Should be referred to as skills (Elements).
- I'm fully in support of a revised curriculum with emphasis on understanding (Other).
- I appreciate and agree with the philosophy behind the draft curriculum (Rationale).
- I do appreciate the extra emphases placed on communicating, problem solving, understanding and connecting. I think, however that with the emphasis across the curriculum on active learning and placing the child as learner and having ownership of their learning already ensures that teachers have been implementing many of the things that have been emphasised in the new curriculum (Elements).
- There are some improvements on the 1999 curriculum in relation to certain Learning Outcomes, e.g. that some of the senior infant content has been increased in expectation. (Learning Outcomes)
- I wonder about progressing more able pupils onto more advanced concepts at second class. There are many other skills that can be explored in a lesson without using different objectives. (Progression Continua).

Negative comments under the broad theme of accessibility include:

- The lack of clear content objectives will make teaching and assessment messy, inconsistent, frustrating (Content/Strands).
- Elements: Don't know why the four mathematical skills are labelled this way. What are elements - parts of a unit? (Elements)
- The four elements used in the draft curriculum do not work in the context of a Maths curriculum. These elements are skills and should remain as such. As it currently is, the 'elements' serve to confuse. (Elements)
- The Learning Outcomes and progression milestones are very vague (Language/Clarity).
- Please clarify "is present at" under" The child" throughout the new curriculum. What does this even mean? (Language/Clarity)

- Please stop telling us you have replaced 201 content objectives with 27 items, you have replaced 201 content objectives with 56 X 7 = 392 learning outcome labels, nearly double. (Learning Outcomes)
- Scotland is the only country to have this format for their maths curriculum and the outcomes there are not encouraging. (International context
- What this questionnaire fails to ask is if this draft curriculum is based on good practice from other countries that are similar to ours and have good results. (International context)

Usability

The second theme suggested by the NCCA focused on usability of the curriculum. This draws again on the topics of Learning Outcomes, Paperwork, Primary Language Curriculum, as well as additional topics such as Paperwork, Workload, Assessment, Differentiation and Implementation, and Multi-grade classes. Comments under this theme tended to be more negative than positive and included:

- Personally, I feel moving towards progression continuum for maths will make maths more difficult to plan and teach. (Planning)
- The draft document is much like the Primary Language Curriculum. It is not concrete enough to be user-friendly. (Primary Language Curriculum)
- It will be very difficult to apply this new curriculum in a multi-grade setting as we are already to the pin of our collar trying to cover the curriculum without having to basically have a different maths curriculum at each grade level. (Multi-grade setting).
- Active learning, while very effective, means the management of differentiated groups at different milestones in crowded classrooms is aspirational. (Differentiation)
- Having read the documentation twice I am still confused by the language and the many subsections. (Language/Clarity)

Support Materials

The third theme suggested by the NCCA, Support Materials, draws on such as planning and resources. While comments related to planning generally tended to be negative, those relating to resources were more neutral, usually calling for additional resources to support curriculum implementation, or referring to a shortage of resources under the current curriculum.

- The hardest part I find about this is the planning and the template used and filling in the template. I would love help in this area. (Planning)

- Teachers need to be supported through resources and meaningful CPD experiences appropriate to their own school context. (Resources)
- We will need lots of equipment and worksheets etc. Therefore extra funding will be hugely important especially if we will not be using maths books.

Other

Comments classified as 'Other', the fourth theme suggested by the NCCA, covered a broad range of issues, and included both positive/neutral and negative comments.

- I think this will really help with the way children learn mathematics.
- I think it is a great initiative and hope it gets implemented asap so my daughter can benefit from it.
- We need more information, more training and need to see results of pilot.
- While the infant curriculum does need to change to reflect the fact that children have more knowledge coming in to primary school there seems to be problems with this proposed new curriculum.
- In my opinion before redrafting the primary curriculum, there has to be collaboration between primary & second level schools as there is a massive shortfall between the two.

Seminars

The analysis which follows relates to the four questions posed to participants at the seminars. The four questions are:

- The key messages underpinning the new PMC
- The key challenges in adopting the new PMC
- The key opportunities in adopting the new PMC
- Supports for enacting the curriculum.

The analysis also examines respondents' comments to an opportunity for open-ended comment.

Key messages

The first question analysed for this report was;, *In your opinion, what are the key messages underpinning the new primary mathematics curriculum?*

Figure 22: The top ten key messages underpinning the new PMC

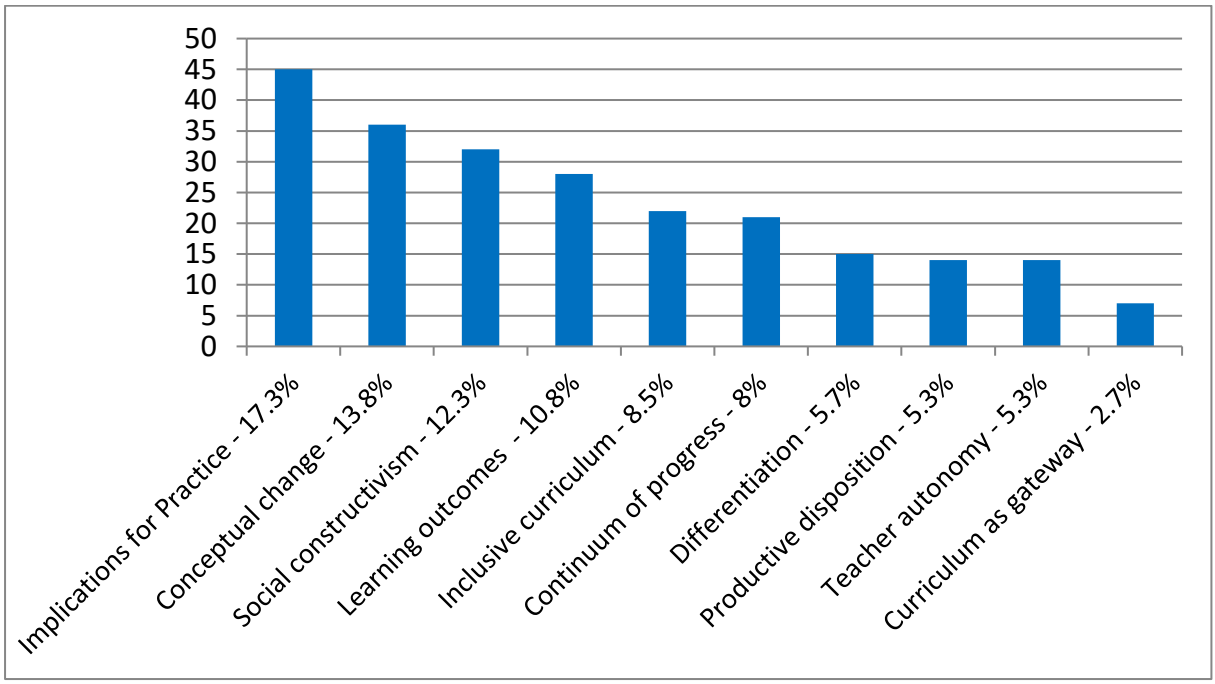


Figure 22 illustrates the top ten key messages underpinning the new PMC, as identified by the ninety respondents. Figure 23 illustrates a breakdown of implications for practice and conceptual change.

Implications for practice

Of the 17.3% of responses which mentioned implications for practice as a key message, the breakdown was as follows:

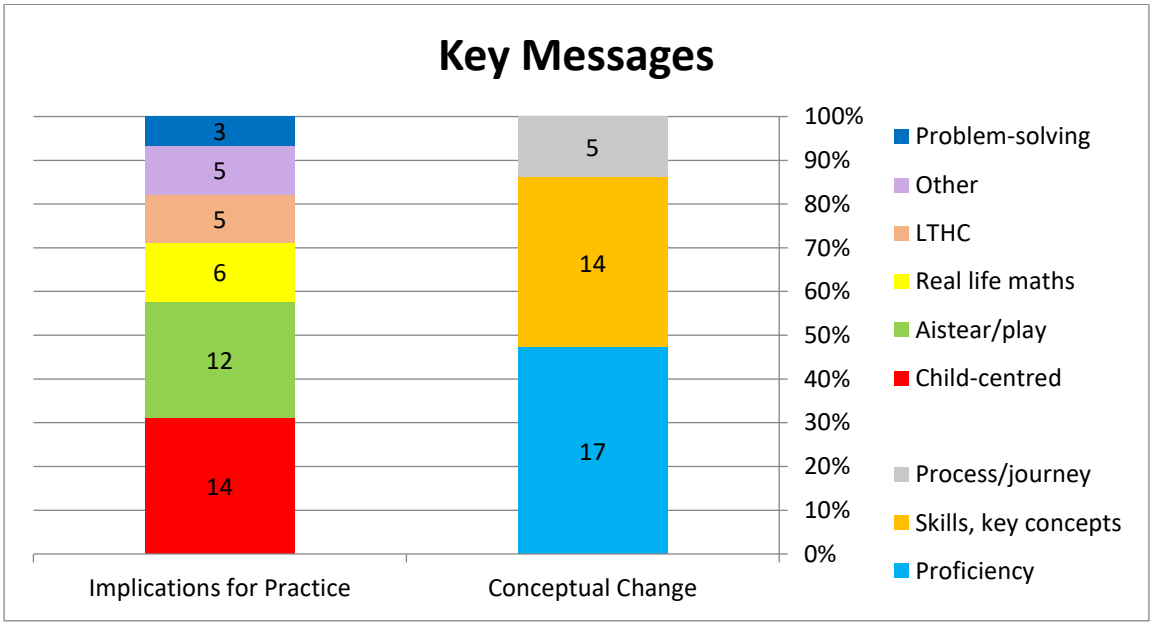
- 31% noted a child-centred approach would take priority
- 27% mentioned the focus on *Aistear* and/or play
- 13% wrote about the emphasis on real-life maths
- 11% perceived the use of Low Threshold, High Ceiling as an implication for practice
- 11% had other examples of how practice would change for teaching mathematics, for instance children taking ownership of their learning through demonstrating and explaining answers while one respondent referred to the additional time given to developing reasoning skills and applying them
- The remaining 7% related to problem-solving

One respondent described the new mathematics curriculum as a way of *providing learning experiences that are low threshold and high ceiling.* Another reiterated this key message, adding *not setting limits for pupils*.

Conceptual change

As for the 13.8% of respondents who recorded conceptual change as a key message, this is broken down further with 47% of respondents identifying proficiency, 39% mentioning skills/key concepts and the remaining 14% describing the journey or process of learning in maths.

Figure 23: Breakdown of responses implications for practice and conceptual change



Social constructivism

Of the 32 respondents who recorded social constructivism as a key message of the new PMC, most referenced the social and interactive nature of lessons. A significant number of respondents used the phrase social constructivism itself, one respondent mentioned peer assisted learning, while another described it as;, *Maths being taught in a collaborative, interactive and engaging learning environment*.

Other findings

Of the 10.3% of the respondents who identified Learning Outcomes as a key message, some respondents referred to the non-specific outcomes over two years, while others focused on children achieving the Progression Milestones of the new PMC. 8.5% of respondents recognised inclusion as a key message, 8% mentioned the Progression Continua and 5.7% referred to differentiation. Productive disposition will be explored further in this report while the final two key messages of the new PMC were identified as teacher autonomy (5.3%) and the curriculum as a gateway, with no barriers (2.7%).

Individual respondents

A number of individual respondents referred to initiatives such as Maths Recovery, Mata sa Rang, Ready, Set, Go-Maths, etc. which go beyond the current curriculum. One respondent identified the new PMC as policy following practice and feels this should be emphasised to teachers in order to ensure they understand the need for this curriculum.

One respondent felt the open-ended nature of the learning outcomes could result in *over-lapping of elements in higher levels*. Another respondent was concerned about long-term planning and how to be prepared for inspectors, stating; *I'm unsure and anxious about assessment and a WSE/inspector's knock when it comes to planning*.

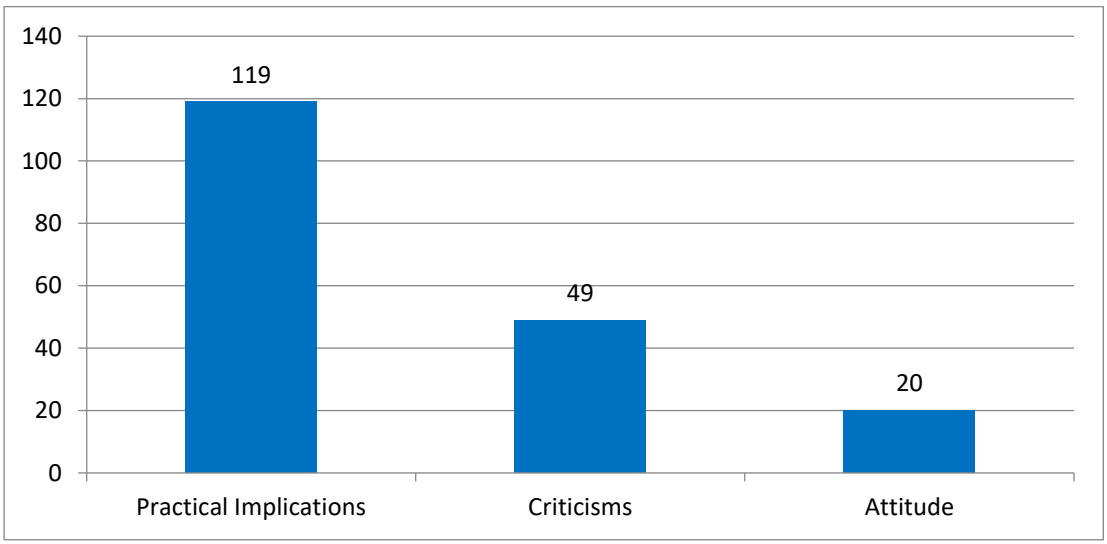
Finally, a number of individual respondents identified the following as key messages:

- Integration/linkage (3 respondents)
- Creativity in teaching (2 respondents)
- Formative assessment (2 respondents)
- Re-energisation of old materials (2 respondents)
- Toolkit to support teachers (2 respondents).

Key challenges

The second question analysed for the purpose of this report is;, *In your opinion, what do you think are the key challenges in adopting the new primary mathematics curriculum?*

Figure 24: Overview of key challenges – number of references



Practical implications

119 responses centred on aspects of practical implications that could be perceived as challenges with the draft PMC.

Table 5: Breakdown of responses under the theme 'Practical Implications'

Practical Implication	Number of Respondents	Percentage breakdown
Resources	40	33
Need for upskilling	20	17
Challenge of planning	18	15
Time constraints	16	13
Pupil-teacher ratio	9	8
Heavy workload	8	7
Differentiation	8	7

Of these 119 responses, one third highlighted the need for resources. A further 17% argued the need for upskilling. Any responses such as CPD, training, in-service, upskilling and courses was categorised under the umbrella term; 'Upskilling'. Upskilling refers to the respondents' requests for upskilling for the new PMC, e.g. how to locate a child's learning on the Progression Continua, how to move a child from one level to the next, how to work with the Learning Outcomes and so on. A number of respondents made it clear that training/CPD/in-service must be provided for all teachers, and catch up sessions must be provided for teachers on maternity leave, career breaks, parental leave etc. Some respondents requested specific durations of training, e.g. a free summer course which would entitle participants to EPV days in the following school year. Another respondent mentioned five days of training – one for each strand, citing that *two days would not be sufficient*. Many emphasised face-to-face training and the need for school closures. The need for in-service to be rolled out before the implementation of the new PMC was emphasised by a number of individual respondents.

The next practical implication was the challenge of planning, with 15% of the 119 responses who mentioned practical implications identifying this concern. 13% of these 119 responses outlined time constraints as a key challenge with one respondent highlighting the huge burden that could follow regarding planning and lesson preparation, stating that there will be a *lot of discord about progression milestones until they are being used and piloted successfully*, *ensuring that teacher workload is minimised*. The issue of time constraints is an area of concern that emerged throughout the feedback, while the final three concerns categorised as implications for practice were pupil-teacher ratio (7%), heavy workload (6%) and difficulties with differentiation (6%).

Criticisms

Table 6: Breakdown of response under the theme 'Criticisms'

Criticism	Number of Respondents	Percentage breakdown
Using the Progression Continua	23	47
Vagueness of language	13	27
Issues of accountability	7	14
Unpopular structure	6	12

Of the 49 responses that had criticisms of the new draft PMC, 47% had issues with using the progression continuum. One respondent noted that having *no markers to indicate where, for example, a fourth-class pupil should be in terms of his/her mathematical development* would prove especially challenging for newly qualified teachers. Over a quarter of those who had a criticism of the new draft curriculum (27%) disliked the vagueness of the language. 14% of the respondents who had a criticism were unhappy due to issues of accountability with one respondent stating that *the inspectorate always want SMART outcomes* and was concerned that the draft PMC *does not enable a teacher (mainstream) to provide these*. Another noted the importance of *communication between the inspectorate and the NCCA* to ensure the steps contained within the PMC do not become *checklists*. Similarly, another respondent noted the need for *more reassurances about whether we will need to have individual profiles for each child stating what milestone they are at in each element,* citing concerns around accountability and what paperwork will be required. The issue of accountability appeared across much of the feedback in this section. Respondents aired concerns in terms of needing to know the minimum point each child needs to be working at within their class level and how this will link to their performance in standardised tests. Concerns emerged about how to assess a child's attainment as *expectations are unclear*. Assessment samples and new standardised tests were called for that would work with the progression steps of the new PMC. The remaining 12% who had a criticism of the new draft curriculum were unhappy with the structure of it, namely its similarity to the Primary Language Curriculum. One respondent felt it would be necessary *to mitigate against the negative experience that teachers had with the new languages curriculum*.

Attitudes

The final theme which emerged from the feedback centred around teacher attitudes, with twenty responses referring to attitude as a key challenge of the draft PMC. Of the twenty responses, one half identified adapting to the new approach as a challenge. One respondent expanded, stating that *the content of the new curriculum* was not an issue and expressed a preference for maintaining the structure of the 1999 curriculum, but *delivering it in a more challenging and playful way.* 30% of those responses categorised under attitude mentioned teachers' resistance to change as a key challenge while the remaining 20% identified teachers' confidence in teaching mathematics as a challenge. One respondent referred to a desire to see a *Japanese lesson study of CPD adopted at primary level for maths*, which would help teachers who *feel less confident or competent in teaching maths*.

Outside the three main themes identified above, a smaller number of respondents identified assessment as a key challenge. Unclear expectations in this area and the need for clarity were the

main issues raised. A small number of respondents identified challenges relating to *Aistear*. Respondents highlighted the need for more training in this area and also cited the challenge of linking *Aistear* with the new PMC.

Key opportunities

The third question analysed for the purpose of this report was;, *In your opinion, what do you think are the key opportunities in adopting the new primary mathematics curriculum?*

122 responses identifying the key opportunities in adopting the new PMC were analysed. Figure 26 identifies the key opportunities categorised under four headings – learning experiences, teacher identity, effective planning and digital learning.

Figure 25: Overview of key opportunities identified by respondents

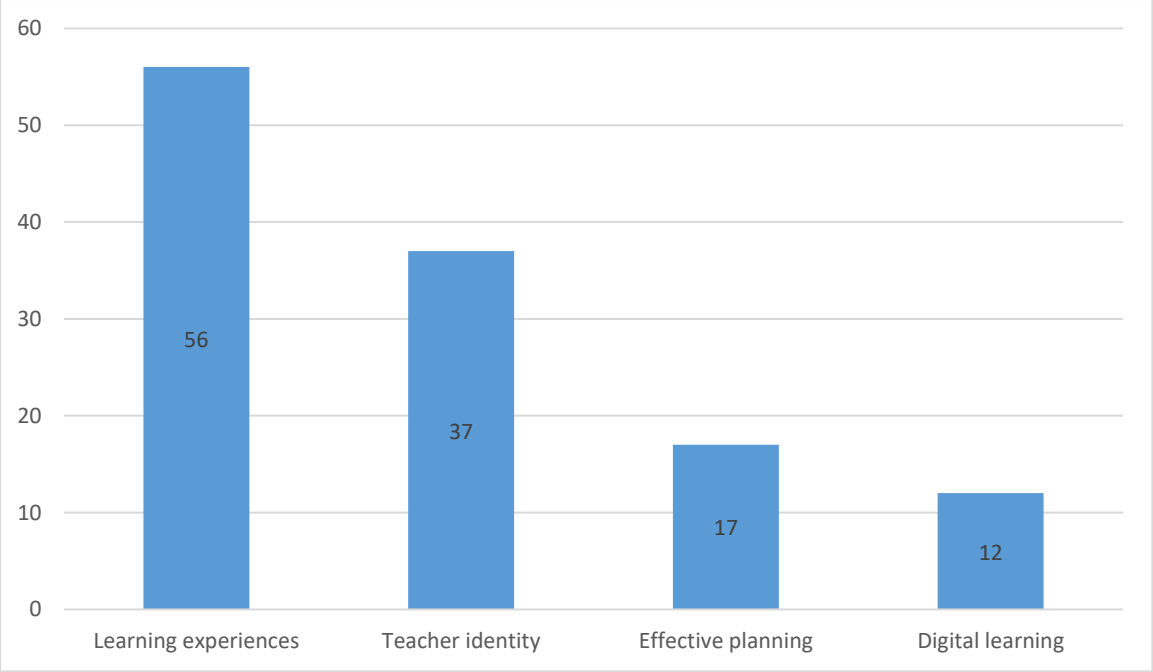
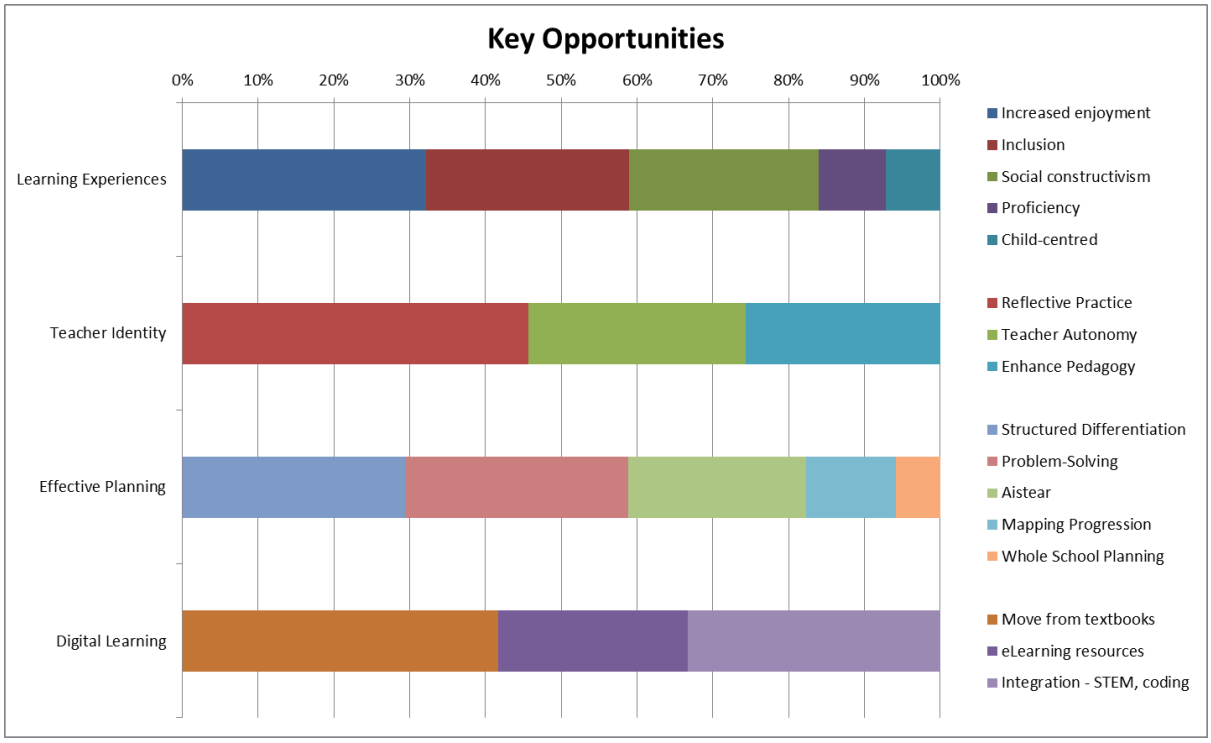


Figure 26: Breakdown of key opportunities of the new draft PMC as identified by respondents



Learning experiences

Most responses (56 out of 122) referred to learning experiences as a key opportunity of the new PMC, with 32% of those 56 referring to the increased enjoyment children could experience in mathematics classes. One respondent noted that *children will engage with and have an improved experience in learning maths*. Another highlighted that the new PMC provides *freedom to offer richer maths opportunities through the playful activities rather than a checklist of objectives*. A further 27% of the 56 responses relating to learning experiences referred to inclusion, with some respondents noting the considerable opportunities for children with SEN that this new curriculum presents. Another 25% of responses mentioned social constructivism as a key opportunity, while 9% stated increased mathematical proficiency and the remaining 7% identified the child-centred approach. One respondent expressed the opinion that this new curriculum will *ensure children will learn in a comfortable environment at their own ability*, while another described the new curriculum as *a child-friendly, child-centred curriculum which will benefit all children in the future*.

Teacher identity

Thirty-five responses were categorised under teacher identity with 46% of these responses referring to self-reflective practice, 28% referring to teacher autonomy and the remaining 26% referring to enhanced pedagogy. One respondent described the new PMC as an opportunity for self-reflection noting that *with every new change, it provides a chance to reflect on and improve teaching*, while

another said the new curriculum provides *a chance to refocus on areas we are in need of improving*. Others viewed it as opportunity for teachers to upskill and improve pedagogical practices. One respondent viewed the draft PMC as giving *the teacher freedom to be creative*, while another noted the *potential to transform teachers' and children's experience of mathematics,* reducing the number *of maths-phobic children and teachers*.

Effective planning

Fifteen responses referred to the potential for effective planning opportunities with this new curriculum. Of these 15 responses, 29% stated structured differentiation. The term "structured differentiation" appears to refer to a greater level of focus that will go into the planning for differentiation. Many teachers highlighted how they are already differentiating in their interactions with their students, sometimes on an informal basis. One respondent viewed it as *another way of differentiating* and *putting more structure on what we are for the most part doing already*.

A further 29% of responses mentioned problem-solving with one respondent stating this curriculum will place *more emphasis on problem-solving and real-world maths*. 24% of the responses that were categorised under effective planning referred directly to *Aistear*. A small number of respondents cited whole school planning and mapping progression as key opportunities.

Digital learning

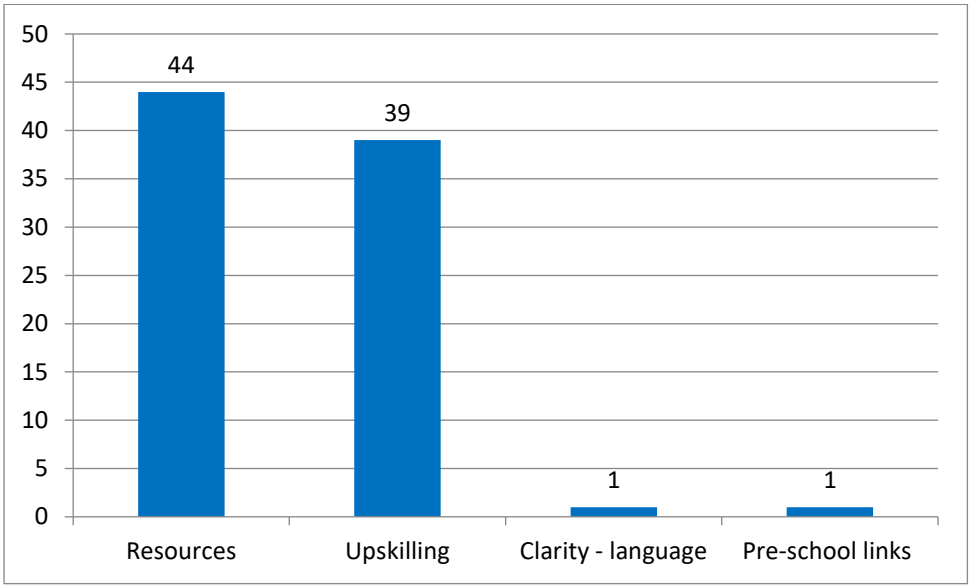
Twelve responses referred to digital learning as a key opportunity. 42% of these respondents look forward to a move away from textbooks to online content, with one respondent stating *it will bring maths into the 21st century.* 33% of responses within digital learning praised the greater opportunities for integration relating to the STEM subjects. The remaining 25% think the new mathematics curriculum provides an opportunity for the creation of a bank of online mathematics resources with one respondent stating that *there is an unprecedented opportunity to develop an online bank of lessons that work well.* This is a belief that was reiterated throughout the responses question 6.

Other points that arose in the feedback regarding key opportunities fell outside the four main themes as described above. One respondent noted that parents may be happier with the new milestones, *hearing that their child is working at level B as opposed to senior infant level*. Another respondent included a caveat stating *if resourced properly, this can make a big difference to the way children learn*. One individual respondent stated that *good practice is good practice*, and this needs to be *acknowledged and held on to*. In relation to inclusion, one respondent reflected that *it is positive to see more of a focus on inclusion has been included in the curriculum* but felt this could *have been added in to the current curriculum's structure*.

Supports

The next question analysed based on the feedback of the ninety respondents from the consultative seminars was; *What supports would be necessary to support you to enact the curriculum? (Rank in order of priority).*

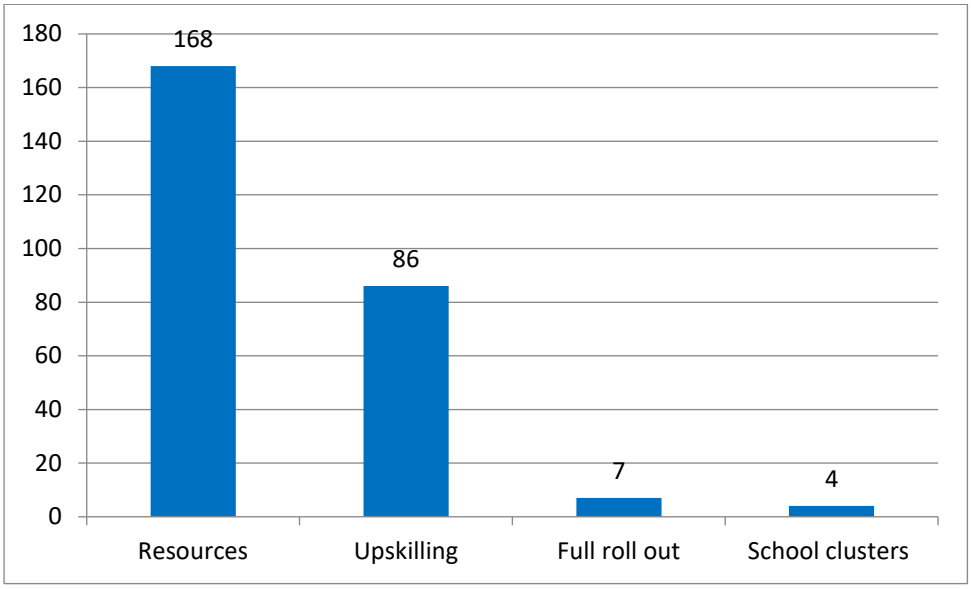
Figure 27: Supports identified in first place by respondents



This question required a different approach to its analysis due to the answers being ranked in order of preference. The first way in which this data was analysed was by focusing solely on the answers provided in first place by all respondents. Figure 28 illustrates the supports needed by teachers to implement the new PMC as prioritised in first place in order of priority. Five respondents did not provide an answer to this question. Of the 85 who responded, 52% referred to the need for resources. 46% of the respondents mentioned the need for upskilling, while one individual respondent identified the need for greater clarity in the language used while the final respondent felt a need for improved pre-school links with infant teachers.

The second way in which this data was analysed was by identifying which supports appeared most frequently overall across the four answers. Figure 29 illustrates the overall mentions across this question.

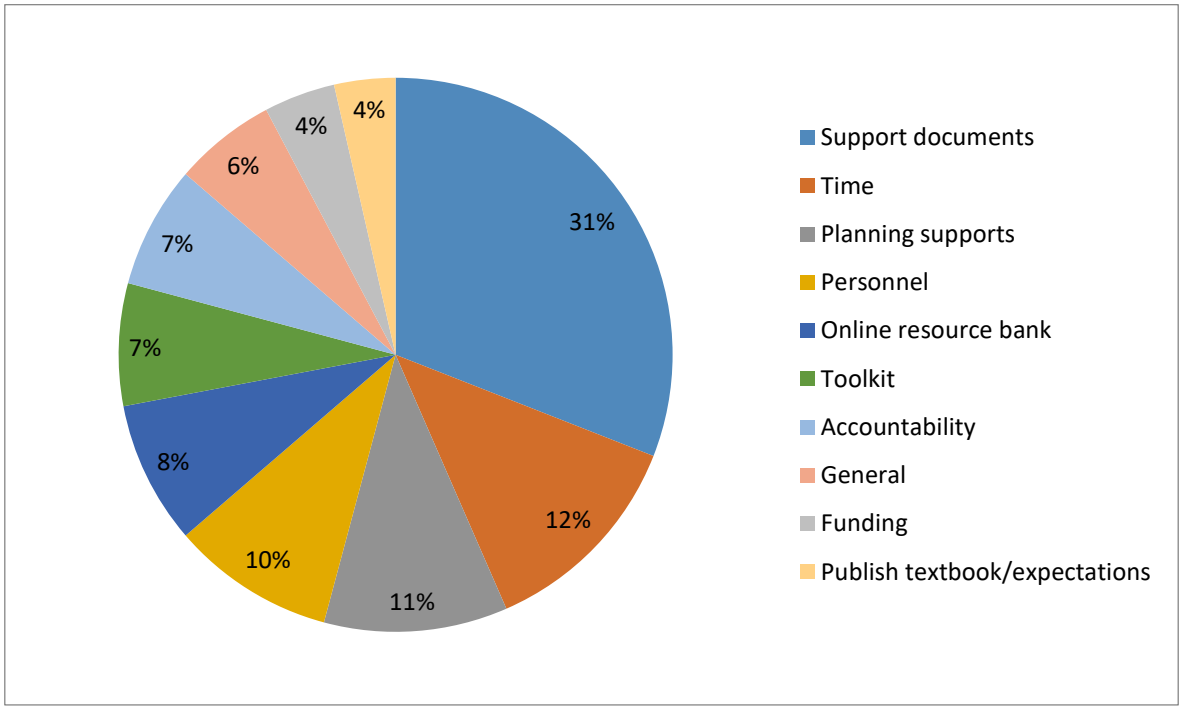
Figure 28: Overall references to supports required to enact the new PMC



It is evident that the need for resources and the need for upskilling are the greatest concerns among respondents. 168 responses referred to the need for additional resources while 86 responses mentioned the need for upskilling. This data has been further broken down in figures 30 and 31.

Resources

Figure 29: Breakdown of the specific resources referred to by respondents



31% of the 168 respondents who mentioned the need for resources identified a need for support documents to help teachers to enact the new PMC. One respondent referred to "WAGOLL – What a

good one looks like" in order to ensure teachers are aware of what the documentation should look like. 12% of the 168 respondents mentioned the need for additional time in order to properly prepare for the implementation of the curriculum. 11% of these responses mentioned the need for planning supports, with respondents calling for *a short-term planning document that was easy to use and can be filled out in a matter of minutes, so teachers can concentrate on creating/sourcing resources to support their teaching.*

10% of the responses referred to a need for additional personnel, while 8% suggested an online resource bank. One respondent called for the resource bank to include exemplars for each strand/learning outcome; *e.g. videos, lesson plans, low threshold high ceiling problems to be readily available online. Why not commission one text book?* Another called for *an online space for maths, like a central hub that is a one-stop shop similar to the one in use in New Zealand*.

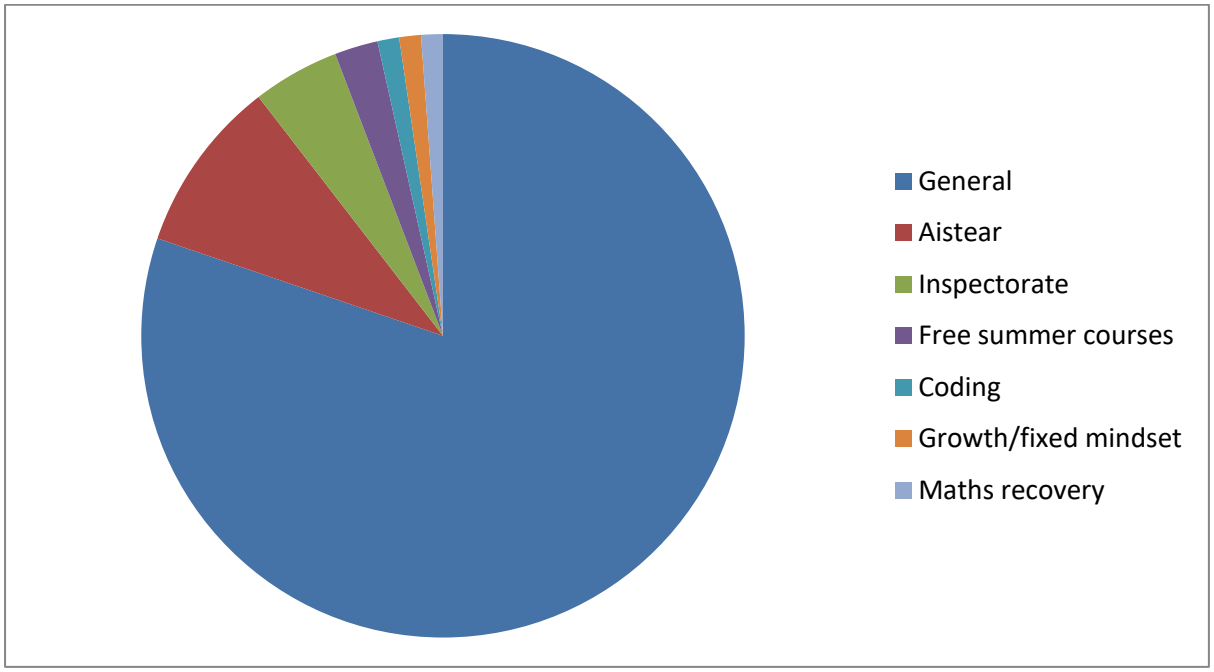
7% of the 168 responses relating to resources mentioned the provision of a toolkit to support the implementation of the new PMC while another 7% of responses sought resources to aid issues of accountability, as discussed previously. Respondents shared concerns in relation to assessment and called for assessment samples and new standardised tests that work with the new curriculum. One respondent called for the revision of *standardised tests to reflect the new Learning Outcomes and skills*.

6% of the 168 references to resources were a general request for resources, while 4% of responses sought additional funding and the remaining 4% advised that a specific textbook tailored to the new PMC should be commissioned, or that *prescribed maths language for each level* should be published.

Some additional insights and recommendations relating to resources that arose included a call for professional learning communities *to allow schools to come together to interrogate research, discuss practice and share ideas.* Another respondent called for *guidance in relation to where the typical first/sixth class child might be in the continua*.

Upskilling

Figure 30: Breakdown of the specific upskilling referred to by respondents



As evidenced in Figure 31, of the 86 respondents who requested upskilling as a support for the implementation of the new curriculum, 80% asked for general upskilling. As previously mentioned, any responses such as CPD, training, in-service, upskilling and courses was categorised under the umbrella term upskilling. This referred to the respondents' requests to be trained in such activities as using the Progression Continua and how to move a child from one level to the next.

Eight responses (5% of respondents who mentioned upskilling) reported the need for the Inspectorate to be trained in the new curriculum in order to ensure that they will be fully aware of what to expect upon entering classrooms and observing maths lessons. It was stated by a number of respondents that the Inspectorate must *be informed* and *kept on board*, while another called for *full training for inspectors.*

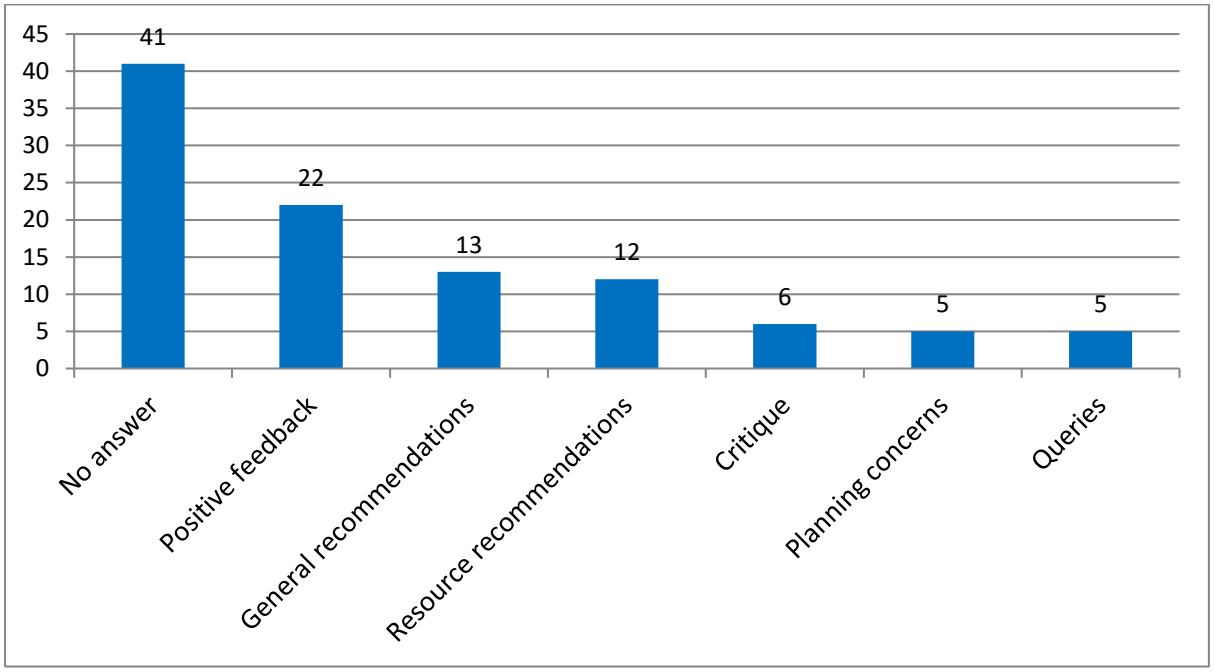
A small number of the responses (3%) suggested the provision of free, EPV-day approved summer courses to provide an opportunity for teachers to prepare themselves for the implementation of the new PMC. Respondents mentioned specific training in areas of *growth mindset, coding* and *Maths Recovery*. Growth mindset is the school of thought that encourages adults to praise children for their effort and diligence as opposed to their intelligence (Dweck, 2007). This ties in with the drive to enhance children's enjoyment of maths, with one respondent recommending the *work of Carol Dweck's growth and fixed mindsets could be linked to productive disposition*. This links back to

question 3 wherein 5.3% of respondents identified productive disposition as a key message of the new PMC.

Other comments

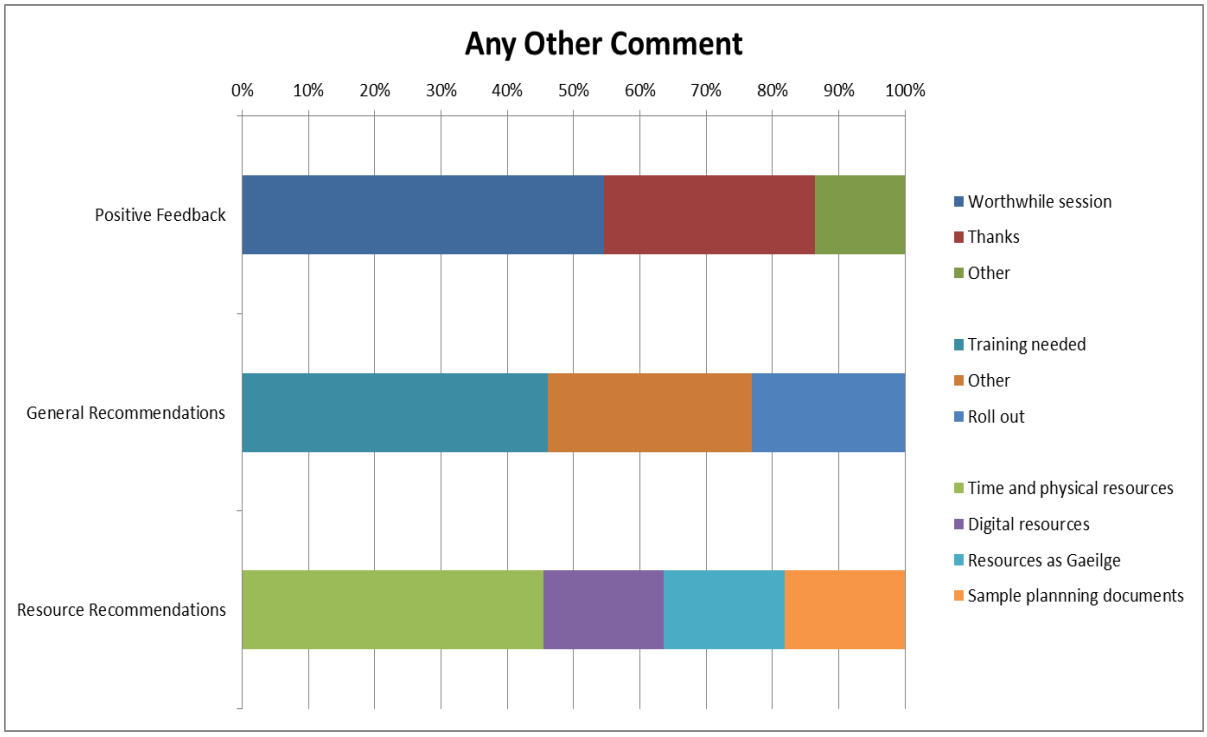
The final question analysed is;, *Any other comments?*

Figure 31: Overview of additional comments in the feedback



27 respondents did not provide a response to this question, which left 63 responses to be analysed for this report. Of the 63 responses analysed, 35% were positive feedback. Figure 33 indicates that 54% of those respondents described the session as worthwhile, 32% thanked the facilitators for their input, while 14% had other positive responses, describing it as a *very informative and rewarding day*. Other respondents stated they felt listened to, while some positive responses charted a change in attitude over the course of the seminar, with one stating that *before today, I didn't fully understand the need to change the maths curriculum. After today, I can see the benefits a new curriculum could bring*. Another respondent referred to *scare-mongering in the system* but following the seminar stated *after today's input, I think the new curriculum will work and improve learning for all children*.

Figure 32: Breakdown of additional comments in the feedback



Of the 13 people who had general recommendations, 46% used this opportunity to state the need for training for teachers. A further 31% referred directly to the roll out of the new PMC. Some respondents mentioned ensuring the language curriculum is fully in place in all class levels with all teachers fully trained in it before introducing the new PMC. Some respondents also referred to other initiatives such as *Droichead,* which is placing an additional workload on schools, stating *there is too much coming altogether*. Others wish to see the entire curriculum ready before it is introduced at Junior Infants, and for the rollout to be done simultaneously across all class levels.

Of the 11 respondents who referred to resource recommendations, 46% identified a need for time and physical resources, 18% referred to providing resources *as Gaeilge,* a further 18% mentioned the provision of sample planning documents and the final 18% focused on a request for the provision of digital resources. One respondent suggested that schools *receive a full sample maths plan that can be edited to suit size of needs of school*.

10% of the respondents used this platform to provide a critique. One respondent called for us to *appreciate our own expertise in Ireland and our track record i.e. PIRLS and not always to be looking to UK or Australia and jumping on their bandwagon*. Another respondent noted that the seminar was a great chance *to air views* but was *worried that planning will now require more time which will take away from teaching time and enthusiasm*. The same respondent stated a preference for

teacher consultative seminar could have been held prior to the designing of this curriculum. Another respondent expressed a concern that there was t*oo much happening in the system too quickly*, while another highlighted the *exhaustive nature of planning is already proving to be an issue for the language curriculum*. One comment noted that the *language for 'a' is very passive and is repeated. It needs to be developed to show what the pupils at this level are able to do*. *Also need to check how 'a' moves to 'b', as it appears to be quite a jump for some parts*. Another respondent expressed concern that the PMC was following the same structure as the Primary Language Curriculum calling for the NCCA to *not follow the layout of the language curriculum document. Learn from it…it has been a disaster*. Finally, one respondent asked *if we are not to grade children at a class level, why have them in the system?*

Other respondents included detailed practical recommendations, such as, the need to *add back in class levels*, highlighting the *massive need for resources* including resources for parents. One comment referred to the new curriculum as being *very aspirational.* Another respondent reiterated the need for the translation of the document to be in more teacher-friendly Gaeilge.

Some final queries and requests from the respondents including a call to *acknowledge the great work has been done through school self-evaluation to improve numeracy in schools*. Finally one comment called on the NCCA to *use social media more to illustrate the good work they do. Trust the research. Don't water the weeds, cut the oxygen as much as possible being given to those who critique from a place of fear and ignorance.*

School network

This section will present the findings of the data collected from schools, from the early stages of the consultation process to the final gathering of schools. Three main themes were identified through the data analysis process described in Chapter 2. These are:

- Presentation and Structure of the Specification
- Curriculum Aims and Rationale
- Supports

Where appropriate, the data is presented in a narrative arc, from the initial engagement with schools through to the final data collection point to highlight the journey the school network made when working with the draft specification. Alongside this, data in relation to children's voice will be presented further to these three themes.

Presentation and structure of the specification

Specification structure – initial impressions

The structure of the draft specification was the central focus of many discussions in schools, with mixed feedback received from teachers.

Many initial concerns raised in this area related to Progression Continua. The inclusion of progression continua in the new structure was viewed as disappointing by some schools, with one noting that *everyone agreed with the research, the pathways are in the research, but we didn't envisage the pathways to be in the form of the Progression Continua.* Other teachers questioned the rationale for using progression continua in mathematics at all and called for this *rationale to be shared amongst schools*.

Teachers exhibited frustrations in relation to using Progression Continua, describing the process as time-consuming and difficult, in a way that did not seem workable. One teacher described it as *very overwhelming; the Progression Continua took over. This is not workable and not user-friendly.* Similarly, another expressed the view that; *when teachers see all the Progression Continua, there is a sense of feeling overwhelmed.* Navigating the specification caused difficulties for teachers initially; *reading through it is difficult, it is very hard to negotiate and find exactly where to start in it.* Another teacher, upon opening the specification for the first time, commentated that they *didn't know what*

to. I tried my best, but I just couldn't use the document. When I opened it, I was just reading and reading, but I couldn't understand what it meant. Teachers expressed a desire for clearer messaging on how to use and navigate the specification; *we should be able to know what to do by looking at one page.* As well as difficulty in navigating the specification, most teachers became frustrated with attempting to place the children in their class on the milestones; *I have spent a lot of time trying to figure out where my class should be.* This experience was echoed by many teachers, sharing concerns about how the Progression Continua could be used for labelling children, with one teacher commenting; *I am very worried that by labelling the Progression Continua as child a, child b etc. that this could allow for expectation of individual labelling of children in the future*. Many examples were shared of teachers trying to plot children on milestones, concluding that it was an *extremely negative and frustrating task and did nothing to improve learning or teaching*.

Almost all teachers noted that the structure was a big change from the 1999 curriculum, with one teacher describing it as *a major divergence from what we are used to.* In this vein, the move away from class levels was the single biggest concern. Several teachers felt the specification did not provide them with a readied list of what they had to teach, desiring a document that they could *pick it up and know what to do.* A number of teachers expressed a preference for content objectives, as used in the 1999 curriculum, with one teacher stating that they *want to know at the end of first class what the children are expected to know.* Another second-class teacher commented that *there is a very clear focus of what was expected for children to learn in the 1999 curriculum, but with the new curriculum there isn't a clear focus on what I have to teach.* Furthermore, a number of teachers expressed a preference for a *baseline of content* to be specified per class level, with one teacher describing it as necessary so as *to know what you have to cover with the class, like a minimum checklist. The content here is too open to interpretation and there is a danger that the minimum will not be covered.* Some teachers feared also that this new structure is placing too much autonomy back in the hands of teachers, and that *moving from class-based content objectives to non-class based, broad Learning Outcomes is too big a leap*. A small number of teachers questioned the level of readiness amongst Irish teachers for such a change, claiming that *while some have very good content knowledge in mathematics, others do not, and research has shown that deficiencies exist in this area in Ireland.*

A number of teachers noted that when beginning the year with a new class, it could prove difficult to know what was covered the previous year. The class handover meetings were described as *short* and *informal meetings* and would not allow for a space to describe to the new teacher *what exactly was covered with every child or group*. As a result, they feared *some children could fall through the cracks*. Other teachers also expressed concerns that content could be introduced too early for

children. For example, when working in place value on the draft curriculum, one teacher noted that the majority of children in her first class *were being exposed to numbers beyond 199 when they may not have a good grasp of place value.* Teachers also referenced difficulties when working with milestones, identifying that in places, *the expectations within the milestones were not consistent, with children working from different milestones for different strands*. Similarly, concerns were expressed for newly qualified teachers, with a number of teachers claiming their lack of experience could severely hamper their ability to work with the new structure; *an NQT would not have the knowledge to know what to start with and where to stop.*

Initial conversations surrounding the structure also included positive commentary. A number of teachers welcomed the new structure, seeing it as less restrictive and reaffirming already good practice. One teacher shared their initial experience; a*s we go along I can see that a lot of what the draft is asking for I would have done anyway and I'm glad that it's in there.* Another teacher commentated that they felt *more tied and restricted in the 1999 curriculum, but now we can move up or down much more easily.* The move to Learning Outcomes was welcomed by a number of teachers, citing consistency with the new Primary Language Curriculum and indeed with post-primary curricula. This alignment was especially relevant for teachers in the special school, where they work with both primary and post-primary curricula on a daily basis. There was broad welcome for the layout of the elements within the specification, allowing for more focus on the mathematical skills. One teacher noted that *the skills (elements) are incorporated more with the content, which brings more focus to these skills*. Another teacher mentioned that *the elements are usefully displayed, making it clearer for me to see what area I am working in. I think a big focus on problem solving is needed in this curriculum revision.* A small number of teachers also cited the new structure as being useful for application in multi-grade classes.

Specification structure – subsequent impressions

As the consultation process progressed and schools came together for the midpoint and endpoint seminars, further discussions on the structure ensued, with clearer understanding emerging on the rationale and role of the changed structure. Subsequent to these discussions, there was a marked shift in the focus of conversations regarding structure. Teachers expressed a collective desire to see *clearer messaging around the function and role of Learning Outcomes and Progression Continua* in the specification. They felt that mixed messaging in the system is leading to confusion and fear amongst teachers. Teachers expressed concerns that the structure was *almost encouraging people to plot children on milestones* and that stronger messaging to mitigate against this was needed. Schools shared a view that the Progression Continua should be presented strongly *as a support, helping to inform, extend and support Learning Outcomes*. A video navigation guide was suggested

that could incorporate support on *how to navigate the new curriculum and outline the role the various structures contained within*. Schools also wanted clearer messaging regarding what a curriculum should do, with one teacher suggesting *we need to have that spelled out first – what is a curriculum and what should it do.*

Some of the initial concerns, shared in the previous section, still featured in some of this later feedback. They related chiefly to the significant change in structure and the removal of individual class levels. A small number of teachers stated that the education system is built upon class levels and therefore curriculum should follow this fact. *We need content per class level, for the average student and we can differentiate up and down from there, as we are already doing*. They also noted that *standardised tests are still per class level and carry more weight than ever by the Department of Education*. Furthermore, some teachers suggested that attributing ages of typically developed children to the milestones would be of use to teachers.

Further suggestions to improve the usability of the specification were gathered from schools. A majority of teachers called for examples of learning to be attached to the steps as outlined in the Progression Continua; *the 1999 curriculum gave examples in italics and something like this will be needed in this new document.* Options for presenting such examples are provided later in this section. Similarly, there was a significant call from schools to include more focus on pedagogies in the curriculum. A number of schools specifically called for the meta-practices, as discussed in the research reports, to be *exemplified and fore-fronted* in the new curriculum; *I can see some mention of them in the appendix, but they should be at the centre of this new curriculum*. Teachers claimed that it was necessary *to be able to see them in action, for example maths talk, show me what it looks like.* Other teachers also questioned why there was no focus on methodologies in the specification and felt that these *should be included if we want to really improve the teaching of maths*.

In relation to the Learning Outcomes, teachers felt that they are broad and vague. While acknowledging this does provide them with more autonomy, there was a desire expressed amongst schools that a further breakdown of the *core concepts contained within these Learning Outcomes* would be useful. This, alongside stronger messaging to their importance, would encourage teachers to view them as an authentic starting point, rather than jumping directly into the Progression Continua. *We know now that the Learning Outcomes are the starting point. There needs to be a bigger focus on them, how to use them needs to be stated clearly.* Another school recommended to *display the critical ideas underpinning the big ideas.* They stated that such *key concepts (content based) under two-year bands would help teachers significantly.*

Some teachers provided feedback regarding the suitability of the number of progression milestones, with a desire to reduce the number from seven to six; *seven is a lot of milestones for four classes, and we feel it should be reduced by one.* Teachers questioned how many more milestones would follow and expressed preference for not more than ten in total, when the proposed third to sixth class specification was factored in.

Some schools reflected on their initial criticisms and offered some insight into their changed mindsets. One school cited their *experience to date in using the new language curriculum had been difficult and fraught with mixed messaging*. They claimed that on viewing a similar structure in the mathematics specification, it caused them to *dislike it straight away*. Teachers valued the discussions with other schools in the network and felt that, after the midpoint gathering, clarity around the rationale behind the curriculum and the role of its various parts improved. They called for this messaging to be *put out into the system*.

Language

Issues relating to language predominantly revolved around clarity and register. The language used in the Progression Continua across the specification was described by teachers as *very wordy* and *difficult to interpret.* A number of teachers gave examples of words they would not have encountered before, describing them as *very technical*. Others reported that the expressions within the steps of the Progression Continua were too complex and at the same time lacked clarity. In making a comparison with the current curriculum, one teacher noted that *the 1999 curriculum did take a lot of getting used to when it came in, but any new words such as 'associative' were followed by an example, so teachers could understand what it meant.* Teachers wanted any new terminology to be exemplified in order to promote agreed understanding. *The language used to describe counting is very tricky. I need to see what it means in relation to actual teaching and learning, examples would help.* While a number of teachers wanted examples to accompany each of the steps in the Progression Continua, others expressed concerns that this would further increase the amount of language contained within them and expressed a preference that examples be placed on the online iteration of the specification or in the teacher toolkit.

Concerns were expressed as to the sheer amount of language contained in the Progression Continua. One senior infant teacher found that *there is an overload of language used in the Progression Continua,* while another commented that the language *should be condensed or made more accessible.* Teachers highlighted the importance *of using teacher-friendly language that can be understood clearly*. They identified the *need for concise language where possible* as currently, they

felt *the Progression Continua are too wordy*. A preference for shorter, more focused statements was expressed.

Towards the end of the consultation process, at the final gathering, the schools felt that a glossary of terminology would be helpful to clarify some terms that are currently causing confusion. When discussing the language in the Progression Continua, a few teachers suggested that having an adjoining version in *child-friendly language* would bring about many advantages. It would allow for a child themselves to *identify their learning, while also providing the language to be used in the learning process.*

In relation to the language used to describe mathematical proficiency and the elements, a number of teachers noted that it was *hard to decipher between skills and mathematical proficiency,* calling for focus on one set of terms. Teachers recognised the value of using the terminology of mathematical proficiency but agreed that more could be done to explain them to teachers, and to exemplify

Leagan Gaeilge

The Gaeilge version of the draft PMC was a source of concern for many teachers who described the Gaeilge used as difficult and unclear. Teachers reported that they *often/always worked from the English translation rather than the Irish translation*. Teachers reported reading the same text multiple times and still not understanding the intention behind the language.

The teachers reported a lack of clarity in the language used noting some specific discrepancies, for example;

- 'Páistí iad haon' – children on their own or children by themselves
- 'eolaíocht' – describe and discriminate
- 'móide' versus 'agus'.

There was a consensus amongst teachers that the translation process is very important. They called for teacher involvement in that process, to ensure the intention of the document is captured and teacher-friendly language is used.

At the final school gathering, it was suggested that the online version be editable to allow schools make changes to fit their distinctive dialects. They noted that this would help strengthen and protect the language in their areas. Teachers also strongly called for all support materials and relevant documents to be made available as Gaeilge at the same time as the English version is published.

Milestone a

The language used in Milestone a formed the basis for many discussions with teachers working in SEN settings. Many teachers felt the language used was *too repetitive*. Similarly, some teachers felt the verbs used in this milestone should be reviewed, with the verb 'present at' particularly drawing reactions from teachers who felt that *it wasn't enough*. However, conversations with teachers in a special school highlighted the need to tread carefully when changing the verbs already contained within the milestone, that while they *may sound uncomfortable to some, if they are made too active then we are at risk of leaving out children*. Similarly, as with the other milestone steps, teachers in the special school felt that samples of children's learning would have to be included so as to exemplify the learning.

Headings and labels

Some issues also arose around headings or titles used in the specification. The wording 'The child', placed underneath the milestone letter headings, concerned many teachers.

> *I can't understand the point of plotting children on a continuum. While I can see why the milestone letters exist in a continuum of learning, if we took away the stem: 'the child', then the letters would become just an expression of progress rather than placing the child.*

When schools gathered at the end-point seminar, there was strong agreement amongst all that any labels referencing 'the child' be removed from the milestone headings. This would help bring the focus back on the learning; *if you were to re-structure the Progression Continua to focus on clear learning pathways as opposed to labelling them 'the child', it might help make them more usable.* Most schools expressed a preference for no word to be attached to the letters to discourage any labelling or categorisation from taking place, while a small number of teachers suggested that 'the learner' would be a more appropriate term.

The term Learning Outcome Label caused confusion for a number of teachers and a preference to revert to the term Strand Unit was expressed. *Learning outcome labels is a mind-boggling term, it took me so long to get my head around it. Why was strand unit changed? Why couldn't it be left the same? I understand we are moving towards Learning Outcomes, but we should keep strand units as a label.*

Presentation

The presentation of the draft specification was generally welcomed by teachers. The presentation of *content on one-page* aided accessibility for teachers and the lack of fold-outs or tabs was also specifically welcomed, with a feeling expressed that they *turn teachers off from reading the*

document. Schools also provided many ideas in relation to the presentation of the document. They called for *more visuals and pictures to be included* to aid teacher understanding. One such example, was to place a visual focus on the meta-practices, calling for them to *be fore-fronted more, so they are constantly in the teacher's mind.* Teachers also felt that the visual presentation of the five aspects of mathematical proficiency could be further improved to help aid understanding.

The removal of the strand Early Mathematical Activities was a concern for a small number of teachers. While they acknowledged that the content from this strand was dispersed between the remaining strands, they expressed a desire that through either presentation or supporting material the focus on this area would be retained.

Significantly, many teachers expressed a strong view that the Learning Outcomes need to be given more focus in the presentation of the document. They felt as it stands, the Progression Continua dominate the document and this needs to be changed; *the focus of the document lies with the Progression Continua as it is. Could we put the Progression Continua in the appendix, as opposed to the centre of the book, where they would be viewed as more of a support?* Schools felt that currently, the Learning Outcomes *do not look like the most important thing* in the specification. At the final gathering of schools, there was general agreement for the Learning Outcomes (relating to one Learning Outcome Label only), the meta practices and the proficiencies to feature together on one or two pages, and these to be followed by the Progression Continua on the subsequent pages.

The online platform was something teachers felt could be utilised to add to the functionality of the specification. One school suggested that *new terminology could be explicitly broken down and presented to the reader using a hover-over function*. In relation to the idea to include the core concepts as presented earlier in this chapter, some teachers suggested that visual representations could be used to further breakdown some of these key concepts for teachers.

Stronger consideration was also called for regarding presenting the meta-practices. One suggestion amongst the schools was to list the meta-practices alongside the Learning Outcomes. Some suggested also that these could be integrated into the examples of learning that will need to follow, but that if this was the case that there would need to be possibly more than one example of learning for each of the steps as outlined in the Progression Continua.

Curriculum Aims and Rationale

This section presents findings from the school network relating to teachers' feedback on the theoretical underpinnings of the specification. Specifically, this data is presented under four main headings; curriculum aims and rationale, inclusion, children's learning and a final questionnaire as conducted with the school network.

Curriculum aims and rationale

There was a broad welcome for the overall aim of the new curriculum, i.e. the development of mathematical proficiency. Following the presentation of the five aspects to the school network, feedback was very positive as to their place in the new curriculum, with one teacher remarking *mathematical proficiency spoke to us very well in Athlone*. When discussing the new aims, one teacher felt that they did *filter into my thinking more than the aims of the 1999 curriculum.* A number of teachers noted that the aspects of mathematical proficiency could be useful when reflecting on mathematics in their school, with one describing a process where one *could map your school onto these aspects. We are a unique school and our strengths would fit into them*. While recognising and reiterating their support for the aspects of mathematical proficiency, some teachers expressed a fear that if they were not somehow *linked with teaching and planning, then the aims of the curriculum would be forgotten.*

Productive disposition was an especially welcomed addition to the curriculum. Following the initial meeting of schools, teachers spoke about how productive disposition had since become more prominent in their minds and in their classrooms. One school shared that they were now *emphasising the usefulness of maths and the children are now seeing this in their lives.* One teacher commented on how *she tells her students how they are excellent mathematicians and how that is making the maths lessons so positive. It is also making the students more confident when working with maths.* A number of teachers expressed a desire for productive disposition to be more visibly exemplified in the specification or elsewhere, *while the other four aspects are more apparent in the content, productive disposition does not feature so I think it will need to be exemplified to bring about real change*. Other teachers highlighted that the terms were predominantly new to teachers and how they will have to be explained further; *I have never heard of productive disposition before, and I will need examples of it in use in the classroom.*

Some schools commentated that their staff had engaged with the research reports and welcomed the content of them. The resulting rationale was described by teachers as *clear* and *focusing on the attributes that mathematics education should be all about*. One teacher commentated that following

the initial seminar in Athlone, that they were *pleased to see that there is an emphasis on "maths for everybody",* and that will improve children's experience with the subject. Other teachers also valued the fact that *this curriculum is for everyone*, while also recognising the focus on *linking mathematics to real life*.

Some teachers wanted the rationale to *focus more on teacher mindset* which they felt *needs to be changed*. While other teachers wanted to know more about the background to the development of the curriculum, asking for *the original remit for change and who specified that it should be a curriculum for all?* They felt that *teachers would be more open to change if they see the reasons behind the new structure and rationale*.

Inclusion

The new specification was recognised by schools as being very inclusive recognising the aim to ensure that every child is included. Teachers working in SEN settings welcomed the outcomes-based approach of the new curriculum.

While there was generally a strong welcome for Milestone a, most teachers recommended that further edits would be required in the language used and for the need to exemplify the learning experiences described. Teachers shared their experiences in working with Milestone a, with one teacher in a special school noting *that the learning described in Milestone a does cater for children with severe and moderate learning difficulties.*

Mainstream schools also shared their experiences in this area with teachers reporting the specification *was a step in the right direction, as the current curriculum set some children up to fail as they are never going to reach what was expected of them at the end of a given class.* Other teachers also gave a welcome to the universal design of the specification and found that it made them *consider the needs of my pupils more.*

A number of teachers called for a need to *break down Milestone a further*, commentating that they will teach children who may spend many of their primary years accessing learning contained in Milestone a alone. They emphasised the usefulness of the current General Learning Disability Guidelines linked to the 1999 curriculum and expressed concern at what would replace these. Another teacher noted that th*e detail within Milestone a was insufficient compared to other milestones, containing less examples.* Schools called for clarity regarding messaging around accessing Learning Outcomes no matter what milestone children are accessing the learning from. Likewise, schools called for further clarity around who should access the learning in Milestone a, with *no reference in the specification to children with EAL and where they should begin their learning journey*

in mathematics. One teacher reflected that they felt a *hesitation as to where a second-class child with EAL should be learning from*. Some teachers also noted that two-year bands are attached to the Learning Outcomes, and that this would not always work for children with SEN.

In contrast, some teachers felt that the new specification was overly-inclusive and questioned whether we should *base a whole structure on a small number of pupils who are already very well included in the system*. These teachers shared experiences in using the current curriculum where they *teach to the main group and are able to effectively differentiate up and down*. They cited the fact that *children with SEN have specific IEP plans and therefore their learning is catered for at their level*. Currently, these children are still accessing learning at their level.

Children's learning

Schools generally welcomed the shift in focus of the new curriculum towards a social constructivist learning experience. They recognised the benefits this can bring and how it can make for a more *positive learning experience* for children.

When sharing their experiences of enacting the new curriculum in their classrooms, teachers described mathematics as *more enjoyable and fun for children.* Several schools made reference to integrating play and *Aistear* more with the draft curriculum. Teachers saw the benefits of linking mathematics with *Aistear*, with one teacher explaining how they are trying to *link it with Aistear more now as I can see the children find it more enjoyable and are able to talk about maths more*. Some schools shared examples of playful learning, with one school creating a learning environment for the children which focused on different learning activities in a more playful approach.

> *We taught the topic of time though Aistear, focusing on a number of different aspects. This is not usually how we would have approached it. We integrated it with other subjects, English and SESE. We used four different stations; role play, junk art, sequencing stories and sorting activities and tried to focus on the reasoning and problem-solving elements.*

The teachers noted afterwards that *lots of learning took place*, with some children engaging more than they normally would. The teachers also described how they completed an activity prior to *Aistear*, where they *promoted the maths language to be used*.

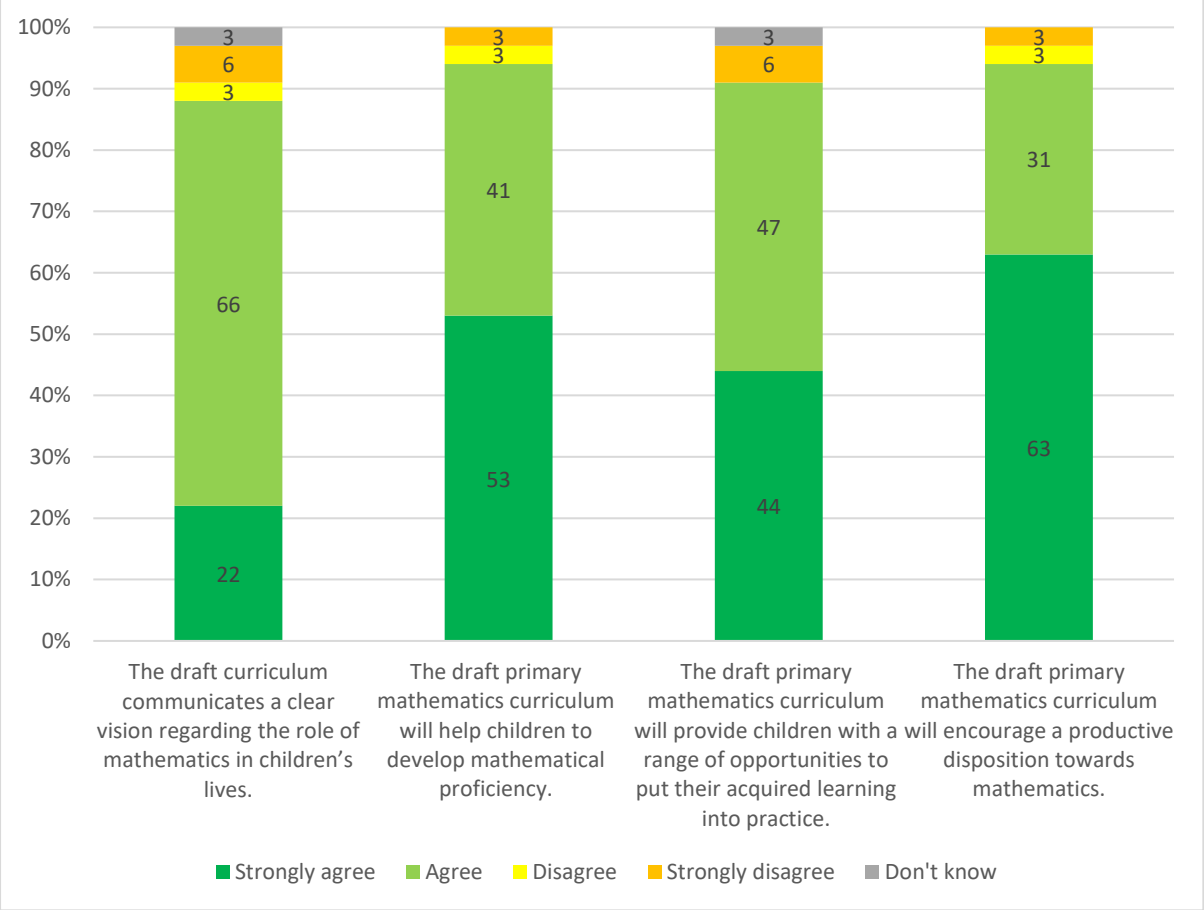
Teachers called for more explicit examples to be given to demonstrate play in action. One school pointed out that *the research pointed out the importance of play-based learning but where in this document does it provide me with examples to use in my class?* Some schools were also concerned at the inclusion of the stem 'through appropriately playful learning experiences' preceding each learning outcome. Some teachers claimed that play was not being used outside of the infant classes

and therefore this would *require a major shift in practice* and called for *more guidance on playful learning in 1st and 2nd classes* to be provided. Some teachers felt they could not see how playful learning could fit into every single maths lesson, but that it could be incorporated in a few times a week, while others asked if *the new curriculum is suggesting that everything is to be taught through play or if there is to be a balance between more formal mathematical activities and play?*

Final questionnaire

At the end of the consultation process with the school network, thirty-two principals and teachers were presented with a final questionnaire. This questionnaire was primarily made up of questions mirroring those in the online questionnaire, while also asking respondents to reflect on the consultation process itself.

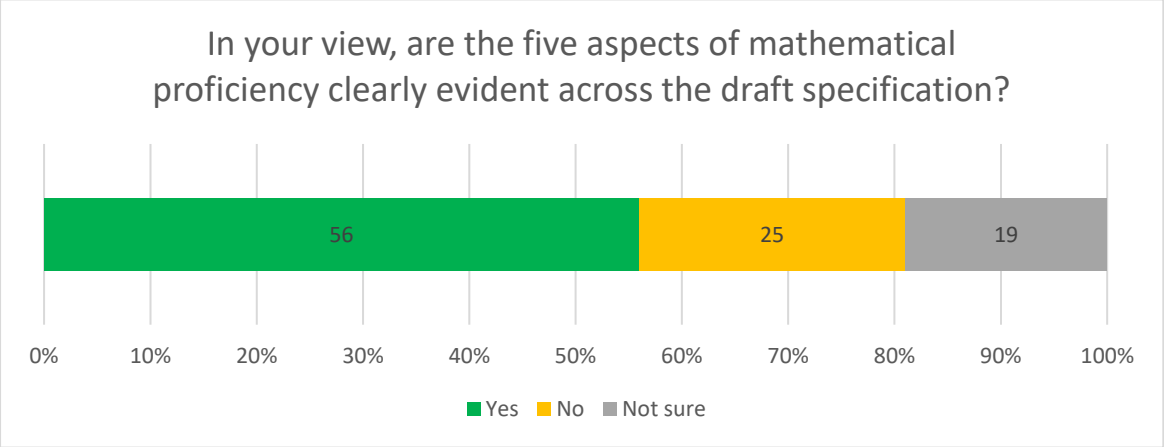
Figure 33: Level of agreement with the statements around vision and aims of the draft PMC



As illustrated in Figure 34, respondents were positive regarding the vision and aims of the new draft curriculum. 88% either 'strongly agreed' or 'agreed' with the statement that the draft curriculum communicates a clear vision regarding the role of mathematics in children's lives, while 9% either 'disagreed' or 'strongly disagreed'. When asked to what extent the draft curriculum would help develop mathematical proficiency, 94% of responses either 'agreed strongly' or 'agreed'. A

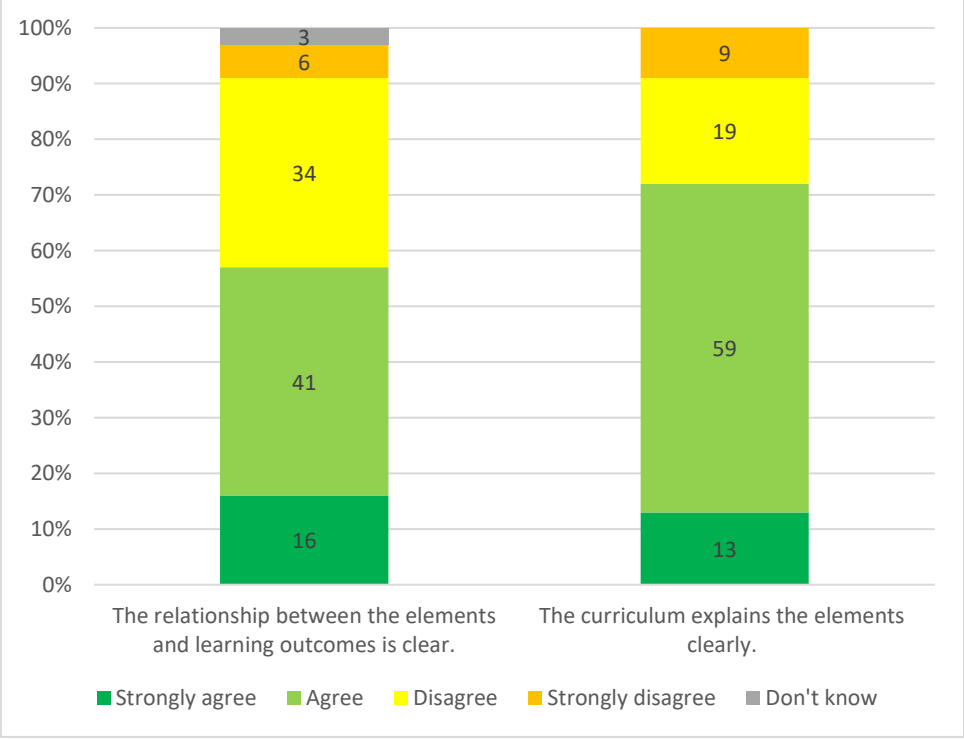
combined total of 91% of respondents either ‘strongly agreed’ or ‘agreed’ with the statement on acquired learning, while 94% either ‘strongly agreed’ or ‘agreed’ with the view that the draft curriculum will encourage a productive disposition towards mathematics.

Figure 34: Perceptions as to whether the five aspects of mathematical proficiency are evident across the draft specification



When asked if the five aspects of mathematical proficiency are clearly evident across the draft specification, 56% of respondents agreed that they were, while 25% felt they were not. 19% of those questioned were not sure.

Figure 35: Level of agreement with statements regarding the elements of the draft PMC



When asked to what extent they agreed with the statement that the relationship between the Elements and Learning Outcomes is clear, a combined 57% of respondents either 'strongly agreed' or 'agreed'. 40% of respondents either 'disagreed' or 'strongly disagreed', while 3% were not sure. The second question asked for extent of agreement with the statement, 'The curriculum explains the elements clearly'. 72% 'strongly agreed' or 'agreed', while the remaining 28% of respondents either 'disagreed' or 'strongly disagreed'.

Figure 36: Responses to the questions on what learning is expected from the Learning Outcomes

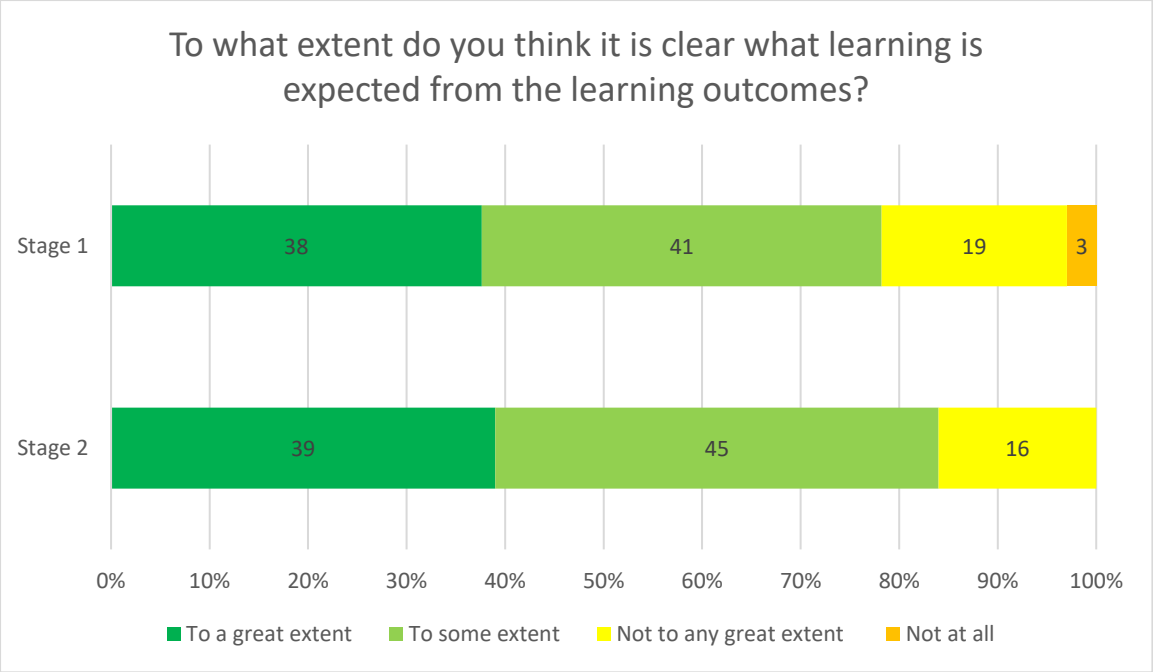
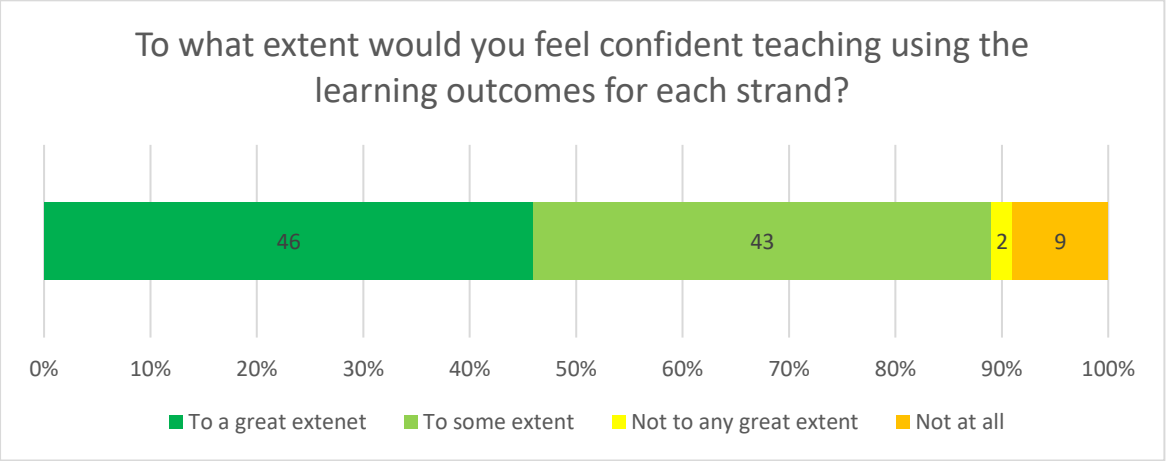


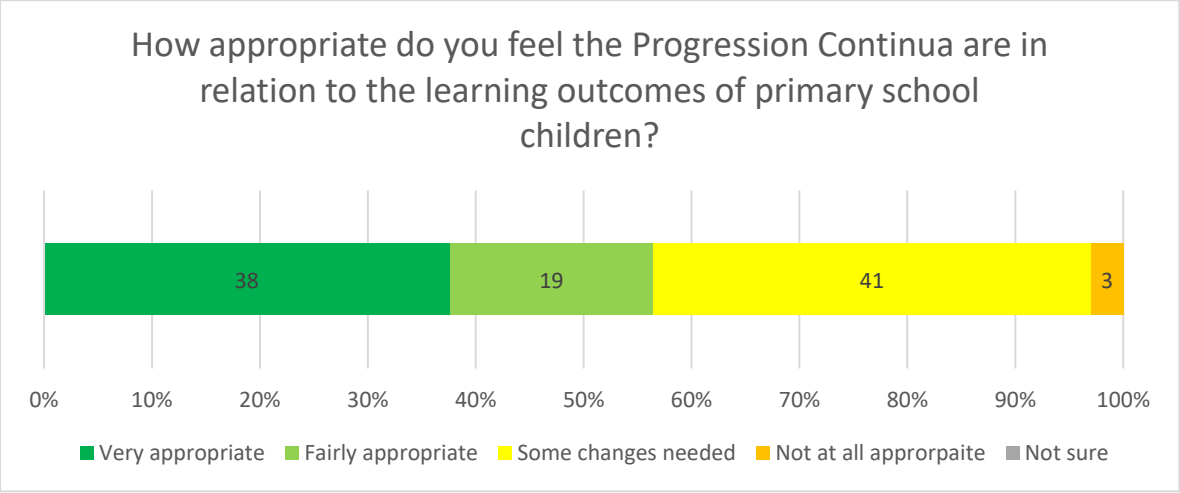
Figure 37 outlines responses to the question 'to what extent it is clear what is expected from the Learning Outcomes' for Stage 1 (junior and senior infant classes) and Stage 2 (first and second classes). Response patterns are very similar for both questions, with 38% and 39% citing it was clear 'to a great extent'. 41% and 45% felt it was clear 'to some extent', while 19% and 16% of respondents felt it was not clear 'to any great extent'. 3% of respondents felt it was not clear 'at all' as to what learning was expected from the Learning Outcomes at Stage 1.

Figure 37: Responses to the question on confidence in using Learning Outcomes



When teachers and principals were asked to what extent they would feel confident in teaching with the Learning Outcomes, 89% of them felt confident 'to a great extent' or 'to some extent'. 2% of respondents did not feel confident 'to any great' extent, while 9% did not feel confident 'at all' in teaching using Learning Outcomes.

Figure 38: Perceptions of the appropriateness of the Progression Continua in relation to Learning Outcomes



When asked the level of appropriateness of the Progression Continua in relation to the Learning Outcomes, there was a broad mix of responses. 38% felt they were 'very appropriate', while 19% agreed that they were 'fairly appropriate'. 41% of respondents felt some changes were needed, while 3% felt they were not at all appropriate.

Figure 39: Level of agreement with the statement that the Progression Continua provide an appropriate level of detail to deliver rich mathematical learning experiences for all learners

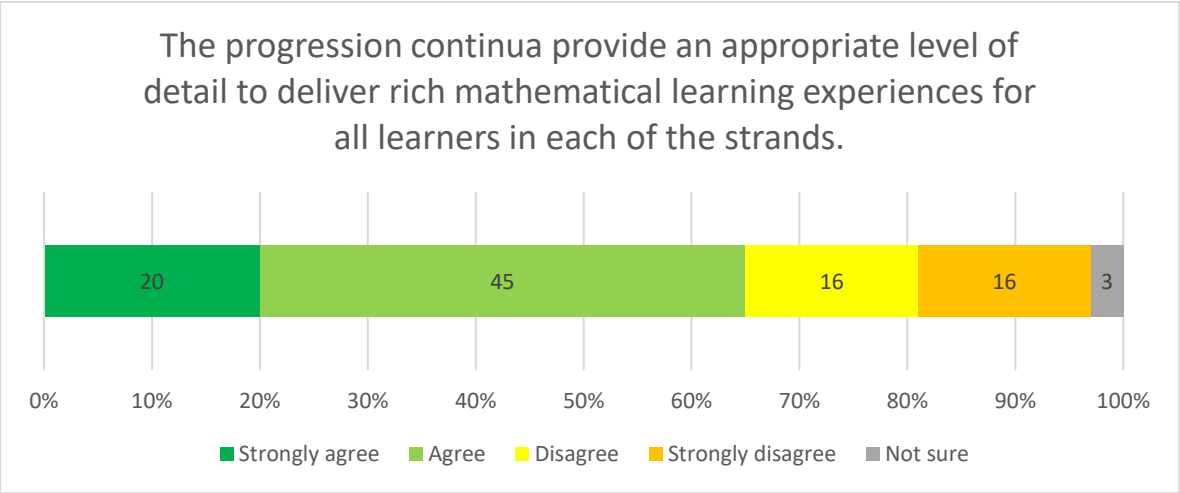
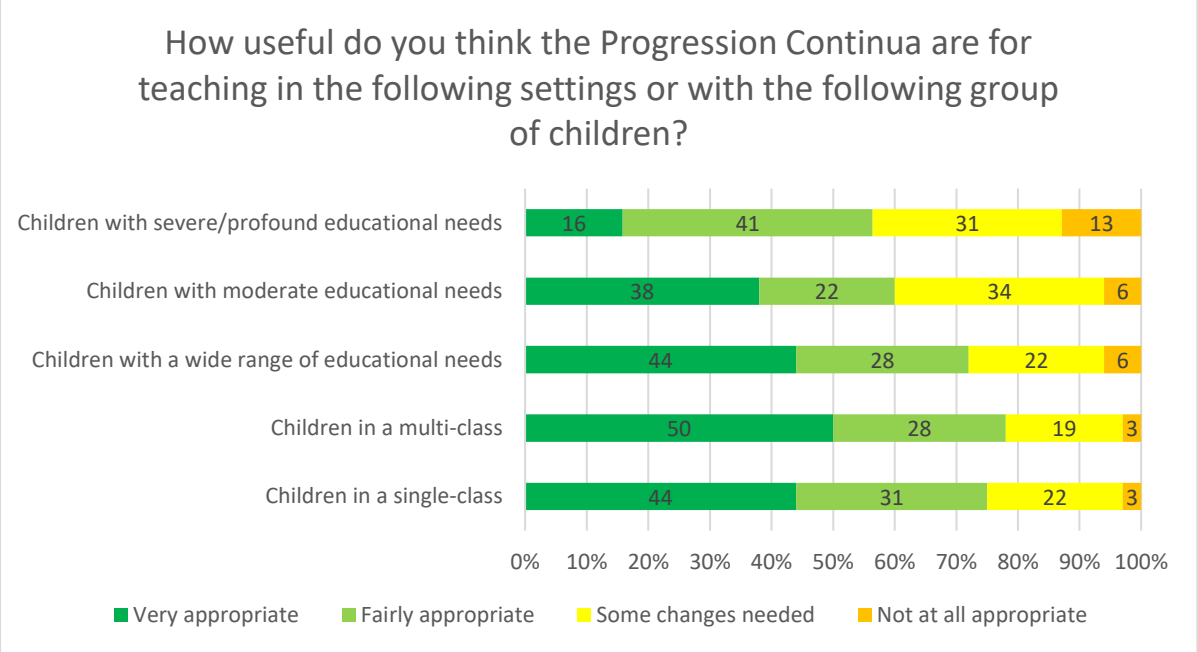


Figure 40 shows the responses to the statement that 'the Progression Continua provide enough detail to deliver rich mathematical learning experiences for all learners in each of the strands'. 20% of respondents 'strongly agreed' with this statement, while 45% 'agreed'. 16% of respondents both 'disagreed' and 'strongly disagreed', while 3% were 'not sure'.

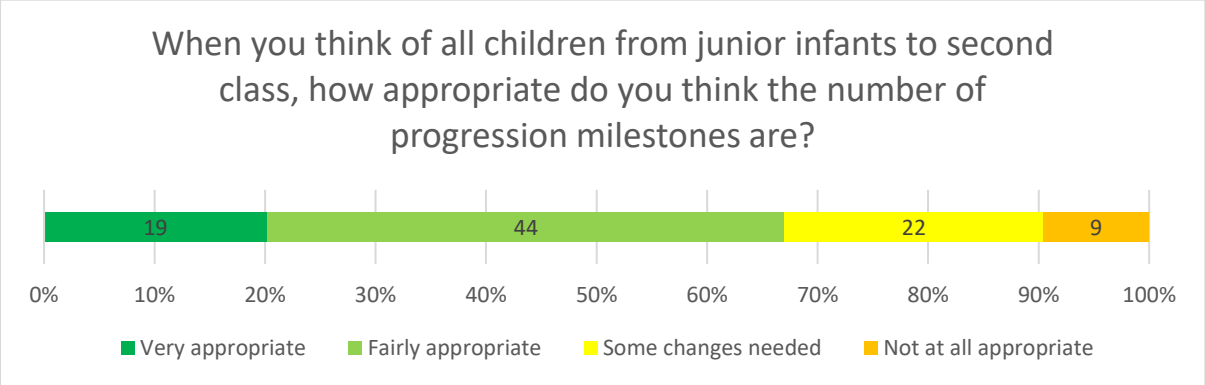
Figure 40: Perceptions of the appropriateness of the Progression Continua for teaching in different settings or with different groups of children



When asked how appropriate the Progression Continua are for teaching children with SEN, three categories were presented. For teaching children with severe or profound educational needs, 16% of teachers felt they were 'very appropriate', and 41% felt they were 'fairly appropriate'. 31% of respondents felt 'some changes' were needed, while 13% felt they were 'not at all' appropriate. For

children with moderate educational needs, 38% and 22% of respondents felt they were 'very appropriate' and 'fairly appropriate'. 34% felt 'some changes' were needed, while 6% felt they were 'not at all' appropriate. When asked how appropriate they were for children with a wide range of educational needs, a combined 72% felt they were either 'very appropriate' or 'fairly appropriate'. 22% of respondents felt 'some changes' were needed, while 6% felt they were 'not at all' appropriate. For children in a multi-class setting, 50% of teachers and principals felt the Progression Continua were 'very appropriate', with 28% agreeing that they are 'fairly appropriate'. 19% of respondents felt some changes were required, while 3% felt they were 'not at all' appropriate. Comparatively, for children in a single-class setting 44% of respondents felt the Progression Continua were 'very appropriate', with 31% agreeing that they were 'fairly appropriate'. 22% of respondents agreed that 'some changes' were required, while 3% felt they were 'not at all' appropriate.

Figure 41: Perceptions on the appropriateness of the number of milestones



When asked how appropriate the number of milestones are in the draft specification, 19% of teachers and principals felt they were 'very appropriate', with 44% agreeing they are 'fairly appropriate'. 22% agreed that 'some changes' were needed, while 9% felt the number was 'not at all appropriate'.

Figure 42: Level of agreement with statements about curriculum change

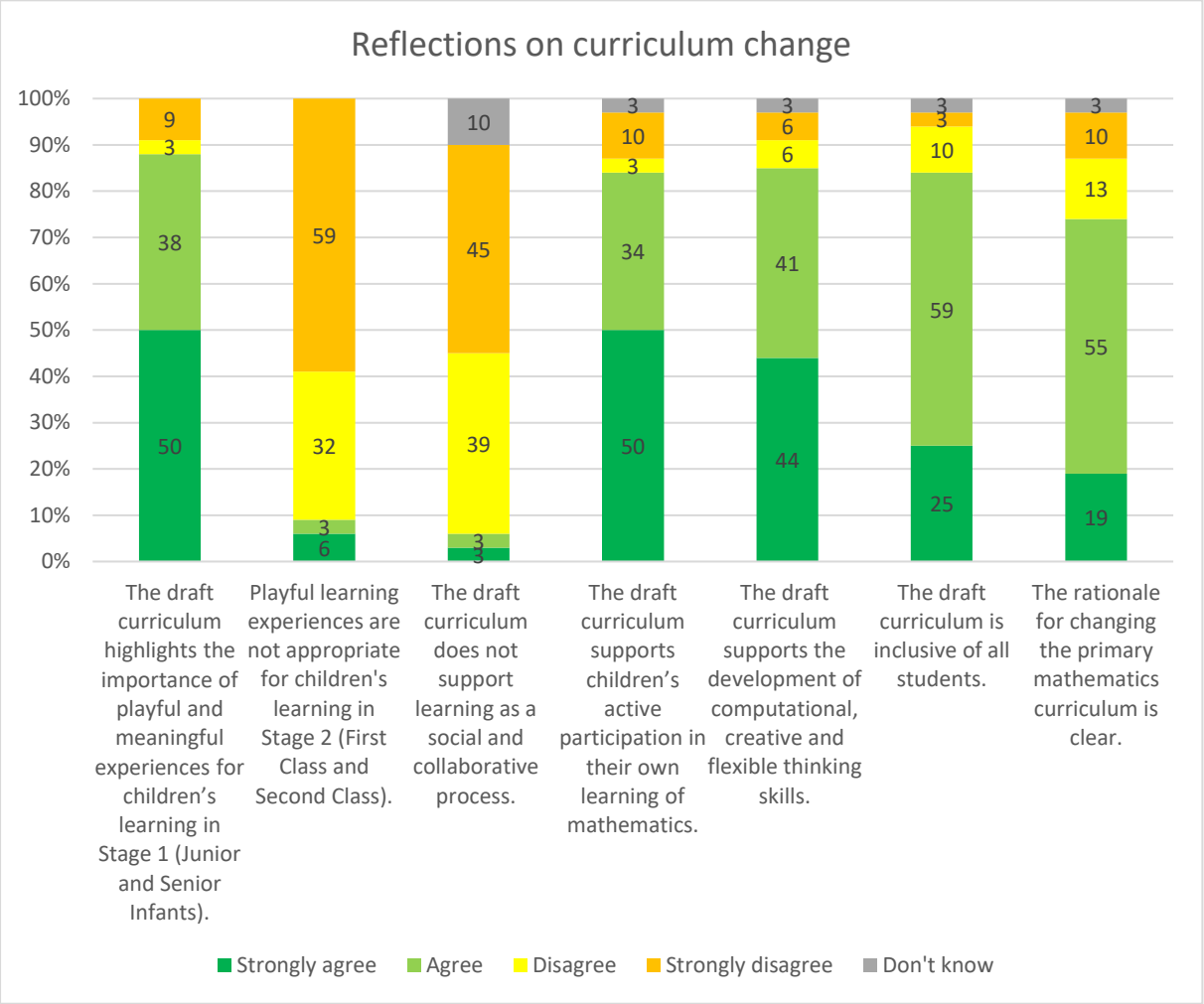
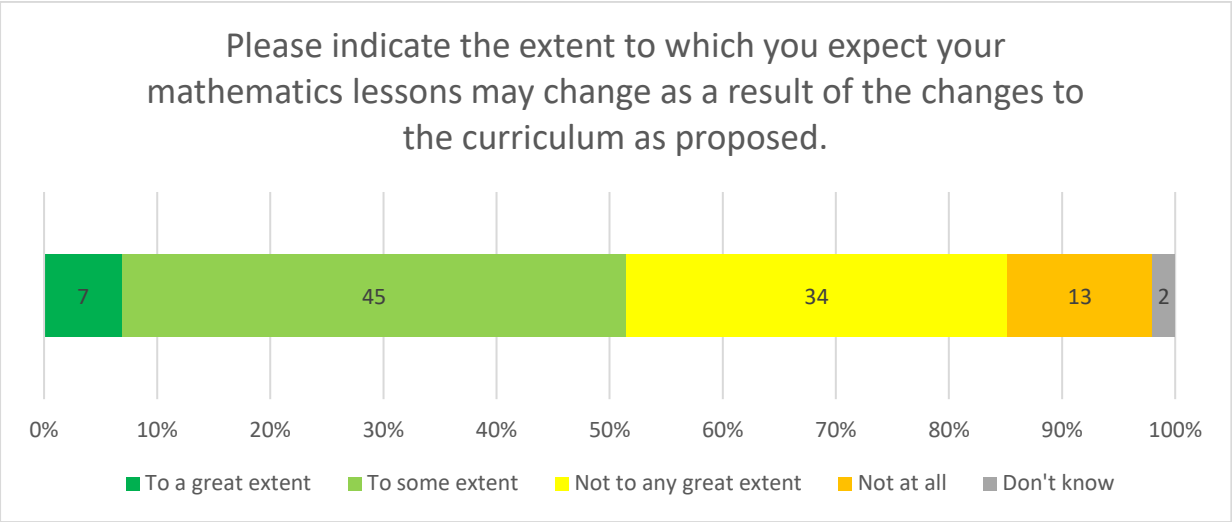


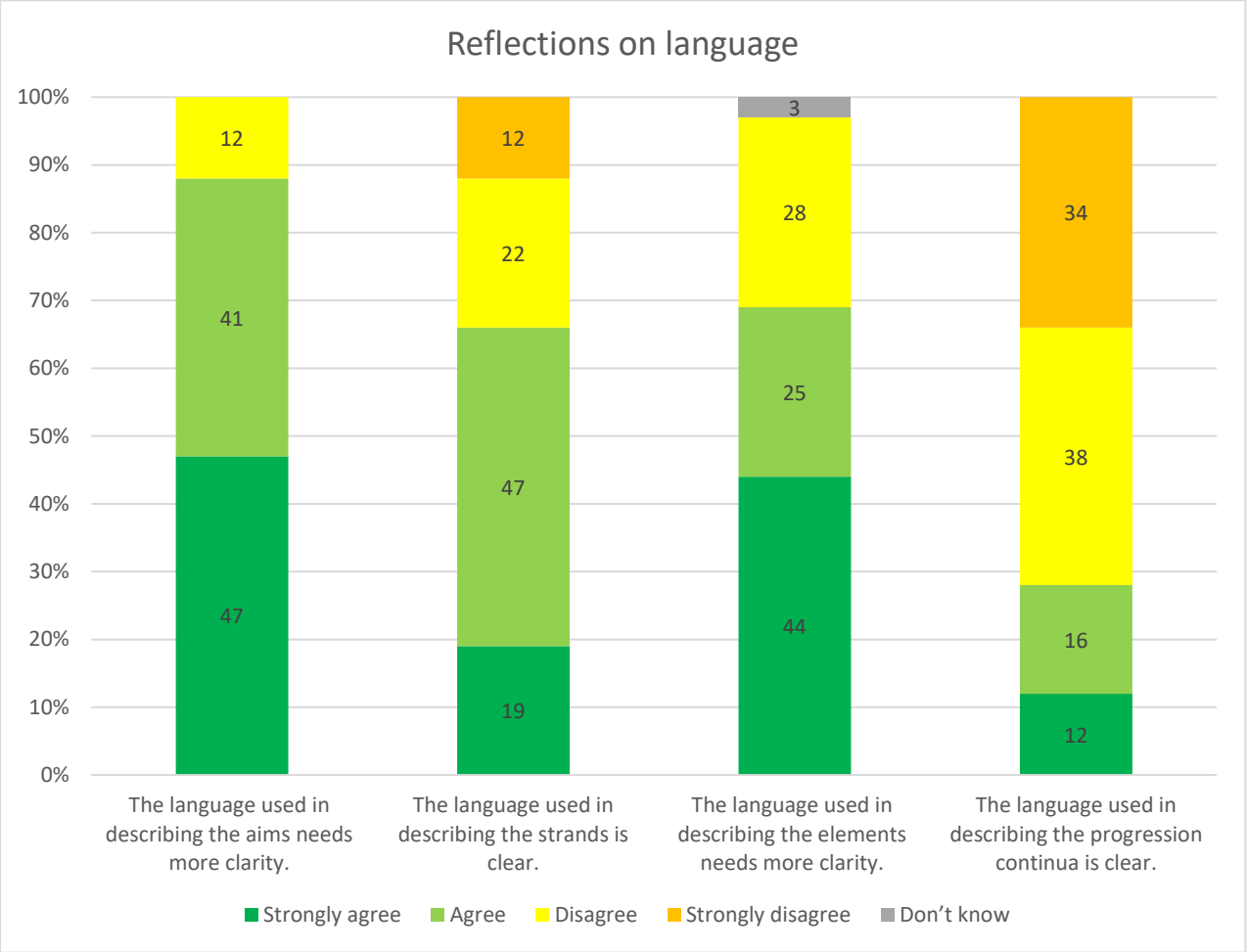
Figure 43 outlines responses to statements linked with curriculum change. Firstly, participants were asked to reflect on the 'importance on playful and meaningful experiences for children's learning'. A combined 88% of respondents either 'strongly agreed' or 'agreed' with the statement, while the remaining 12% either 'disagreed' or 'strongly disagreed'. A combined total of 91% of respondents either 'disagreed' or 'strongly disagreed' to the statement that 'playful learning experiences are not appropriate for children's learning in Stage 2', with the final 9% indicating disagreement. 84% of respondents disagreed with the statement that 'the draft curriculum does not support learning as a social and collaborative process'. 6% indicated agreement with the statement, while 10% did not know. The next three statements relating to supporting children's active participation in their own learning, computational thinking and inclusion garnered similar levels of combined agreement of 84%, 85% and 84% respectively, while in all three cases 12% to 13% indicated disagreement. For the final statement regarding the clarity of the rationale for changing the mathematics curriculum, 74% indicated agreement, 23% disagreement and 3% did not know.

Figure 43: Extent to which mathematics lessons are expected to change as a result of the changes in the draft PMC



When asked to what extent they expected their mathematics lessons to change as a result of the new changes, 7% of respondents felt they would change 'to a great extent', 45% 'to some extent', 34% 'not to any great extent' and 13% 'not at all'.

Figure 44: Levels of agreement on clarity of language used in the specification



When asked to reflect on four statements in relation to the language used in the specification, responses were mixed. Reflecting on the language used to describe the aims in the specification, 47% 'strongly agreed' that more clarity was required, while 41% 'agreed' with this statement. The remaining 12% disagreed. A combined 66% of respondents indicated agreement that the language used to describe the strands was clear, while 34% expressed disagreement. In response to the statement regarding the language of used to describe the elements, 69% of respondents demonstrated agreement that more clarity was needed, with 28% disagreeing with the statement. The final statement relating to the language used to describe the Progression Continua, a combined 72% of respondents indicated disagreement that it is clear, while 28% felt it was clear.

Figure 45: Levels of agreement with statements comparing the 1999 curriculum with the draft PMC

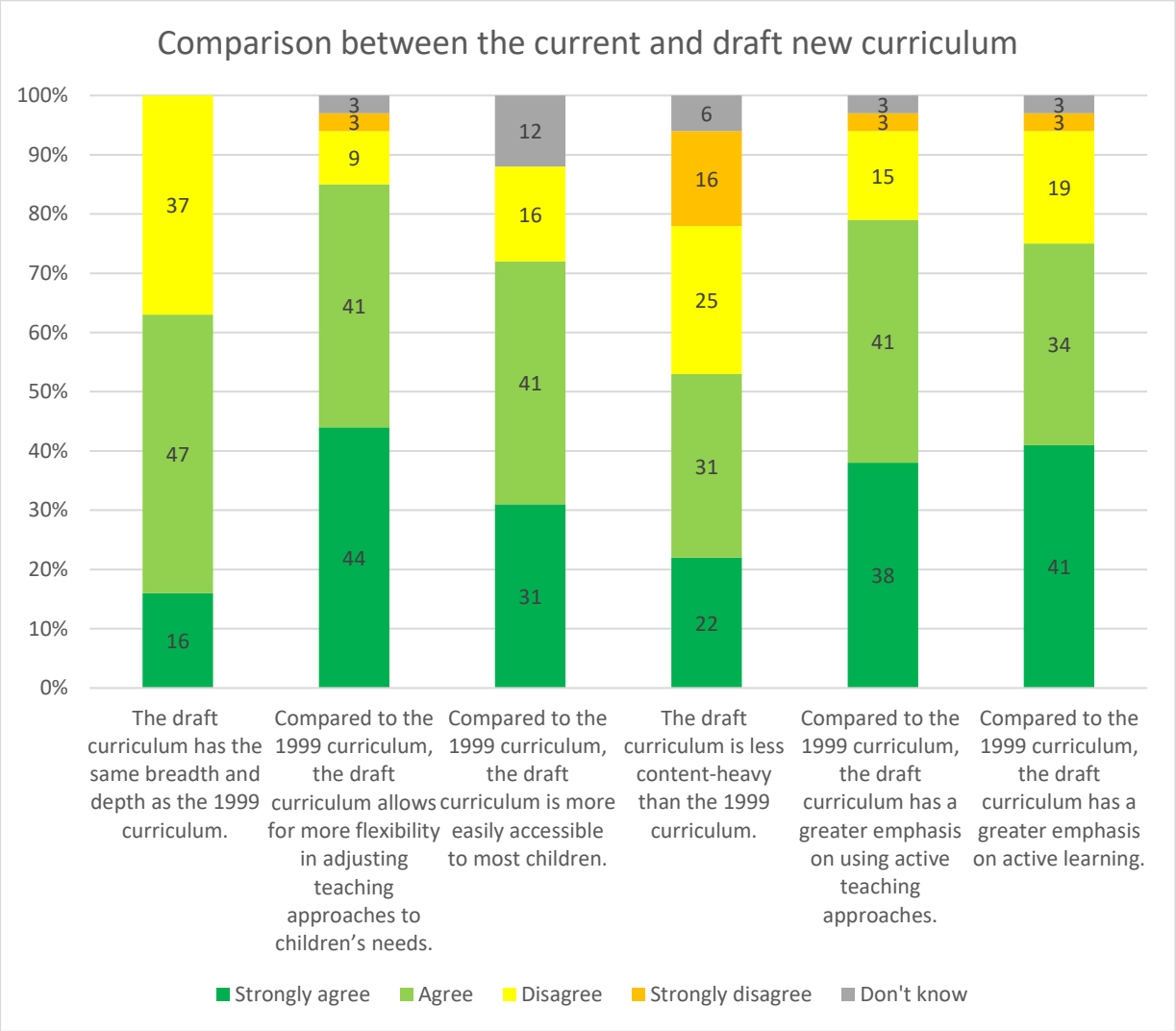
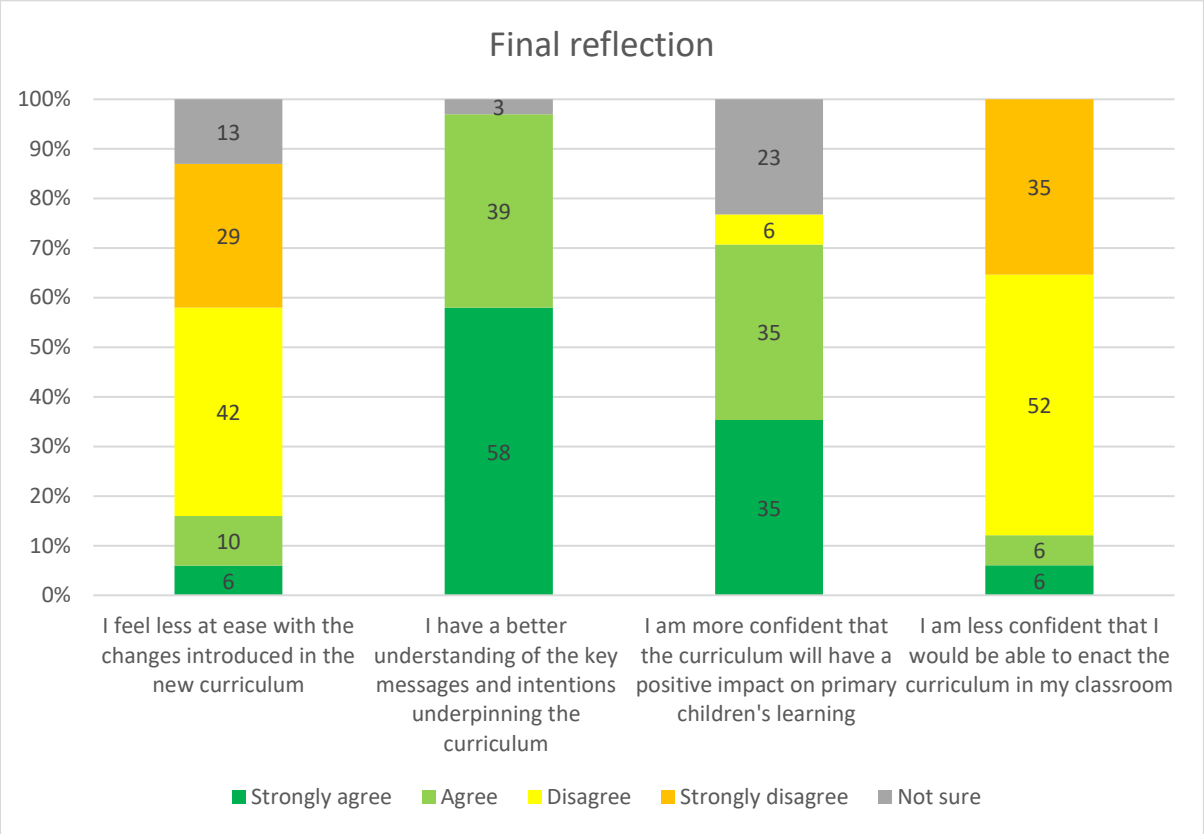


Figure 46 presents the responses to six statements comparing the current curriculum with the new draft curriculum. 63% of respondents either 'strongly agreed' or 'agreed' that the draft curriculum is of the same breadth and depth as the 1999 curriculum, while 37% disagreed. A combined total of 85% of respondents expressed agreement that the new draft curriculum allows for more flexibility in adjusting teaching approaches according to children's needs, with 12% indicating disagreement to this statement. Regarding accessibility to children, 72% of respondents felt the new draft curriculum was more easily accessible, while 16% disagreed. 53% expressed agreement to the statement that 'the draft curriculum is less content-heavy than the 1999 curriculum', with 41% disagreeing. In response to the statement in relation to active teaching approaches, 79% of respondents agreed that the new draft curriculum placed a great emphasis on these, with 18% disagreeing. The final statement asked participants to consider whether the draft curriculum placed greater emphasis on active learning. 75% of respondents indicated an agreement with this statement, while 22% disagreed.

Figure 46: Final reflection on the consultation process



The final group of questions focused on participants final reflections on the draft new PMC. 71% of respondents indicated disagreement with the statement that they felt less at ease with the changes being introduced, while 77% expressed a disagreement that they feel less confident in their ability to enact the new PMC. Importantly, 97% agreed that they have a better understanding of the key messages and intentions underpinning the new curriculum, something which can be reflected in the last section relating to the presentation and structure.m70% of respondents were confident that the new PMC would have a positive impact on children's learning, with 6% in disagreement and 23% unsure.

Comparison with online questionnaire

When comparing the responses as outlined above with the responses from the online questionnaire, a number of notable disparities are evident. In relation to the specification communicating a clear vision regarding the role of mathematics in children's lives, the 88% level of agreement as expressed by the teachers and principals from the school network, compared to 50% as recorded on the online questionnaire. When asked to what extent the draft curriculum would help develop mathematical proficiency, 94% of responses from the school network either 'agreed strongly' or 'agreed'. Significantly, the corresponding figure recorded in the online questionnaire for this question was 42%. The clarity of learning as outlined in the Learning Outcomes also provided contrasting results.

The online questionnaire showed that 60% and 61% of respondents felt that the learning was not clear 'to any great extent' for Stage 1 (junior and senior infants) and Stage 2 (first and second classes). The corresponding results from the school network questionnaire showed much reduced figures of 19% and 16% for the same questions. Furthermore, in relation to Learning Outcomes, when asked how confident participants felt using Learning Outcomes, 89% of respondents from the school network questionnaire expressed confidence to a great extent or to some extent, while this figure averaged at 40% on the online questionnaire. Responses to the statement 'the curriculum is inclusive of all children' 53% responses from the online questionnaire indicated agreement, while this figure rose to 84% of responses on the school network questionnaire. Perhaps most strikingly, when asked to respond to the statement 'the rationale for changing the mathematics curriculum is clear', 17% of responses from the online questionnaire either 'strongly agreed or 'agreed', while this figure rose to 74% of respondents from the school network questionnaire.

Figures relating to some other questions showed closer alignment between both questionnaires, including statements on the clarity of language in the specification. 88% of respondents on the school network questionnaire agreed that the language used in describing the aims needed more clarity, while the corresponding figure from the online questionnaire was 76%. Similarly, for the language used to describe the elements, 69% of respondents from the school network agreed more clarity was required, while 76% was the corresponding figure from the online questionnaire. There was strong convergence in responses to the statement on the clarity of language used to describe the Progression Continua, with only 28% of respondents from the school network and 25% from the online questionnaire indicating agreement that the language used is clear, with 72% and 71% expressing disagreement. Furthermore, when the participants in the school network were presented with the statement 'Playful learning experiences are not appropriate for children's learning in Stage 2' 91% of responses from the school network were in disagreement, while the corresponding figure from the online questionnaire was 73%.

Supports

This section presents findings relating to supports as gathered from the school network. For the purposes of presentation, the data is presented under three headings; planning, curricular supports and non-curricular supports.

Planning

Planning featured as a strong concern for teachers across the consultation. Teachers initially found the planning process *very cumbersome* and *time-consuming*. Teachers expressed strong concerns at the level of paper-work that may be associated with planning and the new curriculum. Some teachers compared new developments to the English system where *paperwork has driven teachers out of the profession* and reiterated a desire for Ireland *not to go down this path*. One teacher expressed a concern *if we have to record everything we're doing at the moment, it's an awful lot of paperwork that wouldn't leave any time for preparing resources*. Some teachers found it *extremely time consuming and unsustainable* when they attempted to include *a list of all the steps from the Progression Continua being used in one fortnight's work. The plan was pages long and much more complicated.* Issues also centred around *what was needed to be included* in planning relating to the new curriculum. Some teachers were *unsure how much is necessary when it comes to writing plans, both in fortnightly plans and in the cuntas míosúil.* When working specifically with the milestones, one teacher asked *if a majority of your class are learning from milestone d and some on c and e, is there a need to write all the Learning Outcomes and steps for both?* Another teacher asked, *in a more play centred classroom, I can see many subjects are been covered at once, even during one lesson, but how do I show this in a plan?*

All schools realised that this new curricular development could provide an opportunity to review what planning should look like. Teachers reflected on current planning practice and add that a lot of material contained in their plans was *not useful for teaching and learning*. In this light, schools were encouraged to develop their own planning template which they feel would be most useful to their setting. They called for a planning template that is both user-friendly and practical for teachers. *We badly need an online planning toolkit for maths. It needs to be user-friendly and cut down on planning time for teachers.* One teacher commentated that they would like *to have everything on the same screen where I could just click on the relevant aim, element and learning outcome.* One teacher suggested that a proper planning toolkit would *alleviate an awful a lot of the concerns around the new maths and languages curriculum.* Schools provided suggestions as to the usability of an online planning toolkit. For ease of use, they suggested a platform where teachers *can click the appropriate Learning Outcomes or learning, and they are automatically included in a planning document*.

The element of creativity was also raised as an important consideration regarding planning. Some teachers wanted more autonomy to design planning suitable to their context, with one asking for example could they *draw a mind-map of my planning or use a graphic organiser to show*

integration? Teachers spoke about how *events occur that are unplanned for* and rather than ignore the learning possibilities they should be afforded *an opportunity to adjust planning to reflect them*.

Curricular supports

The importance of a well-resourced toolkit was emphasised by many schools. A number of schools highlighted the system's *unhealthy dependence on textbooks* and saw the new curriculum as an *opportunity to break away from allowing textbooks dictate teaching and learning*. To achieve this, many teachers felt that *the attached toolkit will have to be very well resourced, otherwise teachers will revert back to the textbooks.*

There was a very clear call from schools to include *learning activities and tasks* among future support material. Linking such supports to the progression steps was a strong preference that emerged from schools, with teachers calling for *examples of how to make this real in the classroom*. Another school called for *examples of rich tasks because different interpretations exist as to what they look like*. *Examples of low threshold, high ceiling tasks* were highlighted as being a necessary part of the toolkit, *providing examples of learning that all children can access*.

Schools emphasised the need for support in the area of play and playful learning. With this focus described as *still relatively new to schools*, teachers asked for examples of playful learning in practice and if links between *Aistear* and the new mathematics curriculum can be exemplified.

In the area of SEN, schools provided suggestions for further support. A further breakdown of the learning in Milestone a was called for, with some teachers suggesting that this could achieved in the support material. Teachers cited the *SEN Pathways* support material for the new languages curriculum. Some teachers felt this would be useful in a mathematics context once it was *made relevant for maths*, while other teachers felt *it was not detailed enough in its current form*. Teachers also highlighted the current importance of the *General Learning Disability Guidelines* and how intertwined with their practice they have become. They felt *new supports will be required* if they are to move away from them. Teachers expressed a view that *guidelines around moderate and severe will be needed to match the new curriculum*. Teachers in the SEN setting also suggested including sample targets in support material which would be included in an individual education plan. These targets would need to be *more detailed than what is already contained within the specification*. A number of teachers also called for specific guidance or support for working with children with EAL, while others mentioned the need for support material to help cater for the exceptional child.

A number of schools called for more support around methodologies. These schools felt that the new curriculum presents a great opportunity to allow teachers *reflect on how they are teaching*

mathematics and encourage teachers to provide children with a positive learning experience. Schools responded positively to the meta-practices discussed at the collective seminars and expressed a wish for the support materials to forefront *these new methodologies and new ways of looking at maths*. One teacher stated that *it all boils down to how you are facilitating the learning for the children, the questions you are asking them are so important, so we need support materials with these questions and questioning methods*. Relevant to this area also, teachers called for language and examples on how they could portray maths in a positive way for children. This could be provided in *sample conversations or ideas which promote mathematics as a useful and exciting subject.*

One school shared its experience of team teaching and expressed a desire for supports to be put in place to encourage other schools: *We have moved towards team teaching in maths and it is a fruitful thing for the school. We started in one class and progressed it up along. Schools need support in how to get this up and running.*

Schools called for specific support materials to be developed on the mathematical vocabulary to be used in each learning outcome label. Teachers felt that such supports would *emphasise the importance of maths talk and would be very welcome by all schools*. Teachers teaching in Irish-medium schools also called for *teanga mata* to be included.

Teachers stressed the importance of including specific resources linked with the area of early mathematical activities. They recommended that these were needed to *recognise their importance as a crucial starting point in their mathematics education*.

Regarding integration, some schools expressed disappointment that the specification itself did not contain any explicit ideas for integration. Teachers called for these to be included, either in the specification or in the accompanying toolkit, stating that they *need strong integration ideas if the system is to move away from the rigid subject individualised regime*. Teachers highlighted project-based work as something that could be exemplified which would encourage teachers to move to a more integrated way of teaching. Schools felt mathematics and its relationship with other subjects needs to be highlighted. This would also have the benefit of teachers and children seeing mathematics in many instances *outside the maths classroom*. Another school also viewed integration as an opportunity to further strengthen links between the STEM subjects.

There was a strong call for direct support material relating to problem-solving, with schools identifying this as an area that they find hard to source resources in. Teachers pointed out that *while the specification tells us to solve problems, the support material should provide us with the different types of problems and with strategies that we can show the children.* There were calls for *examples*

of word-based problems that match each milestone, for *examples of problem solving that is not word based* and for the *steps of problem-solving to be included*. Schools felt that including a *suite of worked examples*, with solutions and strategies would be a useful starting point to promote more problem-solving in classrooms. This would also provide an opportunity to show how *problems can be a platform for integration across a number of subjects*.

Support materials in the area of assessment were called for by the majority of schools. The lack of assessment guidelines in the new specification was highlighted by teachers as an issue. They called for supports *particularly in the area of formative assessment*. One school commented that *developing teachers' and pupils' understanding of assessment, and especially the role of constructive feedback was crucial to the learning process*.

Some schools suggested that a list of concrete materials would prove useful. A *suggested list of resources that would be needed to implement the curriculum according to each strand* would provide schools with a baseline of what materials they would require. Teachers noted that such a list would be particularly useful for newly established schools.

Schools also identified the need for support materials for parents. They highlighted the home-school link as being of *utmost importance*. Suggestions included games, home activities, nursery and counting rhymes. Schools also called for materials to be created to update parents on the new curriculum, including a summary of the shift in emphasis on the way children learn best in mathematics.

In relation to the stronger messaging as outlined earlier in this chapter, schools felt support material on using the new curriculum and in particular around accessing Learning Outcomes would be useful for teachers.

A number of schools shared an idea for a central hub for all resources linked with the new mathematics curriculum. Included in such a space could be an *online forum in which teachers could interact with other teachers to share experiences and practice*. Teachers expressed a preference for a central point instead of the need to *sift through many websites to source relevant materials*. Teachers suggested having a dedicated website to the new mathematics curriculum would help promote change and *act as a one-stop shop for primary maths similar to the project maths website* at second-level.

During the final gathering of the school network, schools outlined support materials relevant to the learning outcome label of Place Value. This area was chosen by the schools themselves who

identified it as a particular area of difficulty in relation to teaching and learning. The schools suggested ten key areas for support materials:

- Language of mathematics to be used (linked to the Progression Continua)
- Early mathematics activities and concepts
- Interactive activities with suggested concrete resources
- Examples of teacher questions
- Problem solving activities
- Examples of formative assessment in this area
- Parent information sheet
- Videos exemplifying common misconceptions
- Rhymes and songs
- Sample lesson plans.

When discussing more generally what format the support materials could take, some schools expressed the preference for using a variety of platforms including videos, podcasts, downloadable documents and online interactive lists. One teacher noted that videos *which currently exist on NCCA website for parents are very helpful and similar videos could be made to focus on key aspects of learning for teachers*. Schools felt that the online space could allow for greater connectivity between the specification and the support materials, allowing the user to be taken directly to relevant supports relating to a specific learning area. Teachers in Irish medium schools expressed a desire for all resources to be published in both Irish and English simultaneously.

Other

Consultation process

The importance and challenge of teacher mindset was highlighted through the consultation process. At the final collective gathering of schools, teachers took part in a reflective activity in which they compared, in a word, their thoughts about the consultation process at the beginning and at the end.

Table 7: Participants in the school network comparing their thoughts at the beginning and end of the consultation process

Participant	Beginning	End
1	Frightened	Adapting

2	Confused	Optimistic
3	Confused	Informed
4	Interested	Confident
5	Overwhelming	Relief
6	Worried	Hopeful
7	Frustrated	Empowered
8	Confused	Excited
9	Curious	Intrigued
10	Confused	Clear
11	Disappointed	Confident
12	Annoyed	Excited
13	Confused	Calmer
14	Frustrated	Inspired
15	Daunted	Enthused
16	Lost	Enlightened
17	Lost	Informed
18	Scared	Interested
19	Overwhelmed	Fearful (Implementation)
20	Overwhelmed	Excited
21	Alarmed	Clear
22	Scared	Comfortable
23	Uncertain	Hopeful
24	Overwhelmed	Comfortable

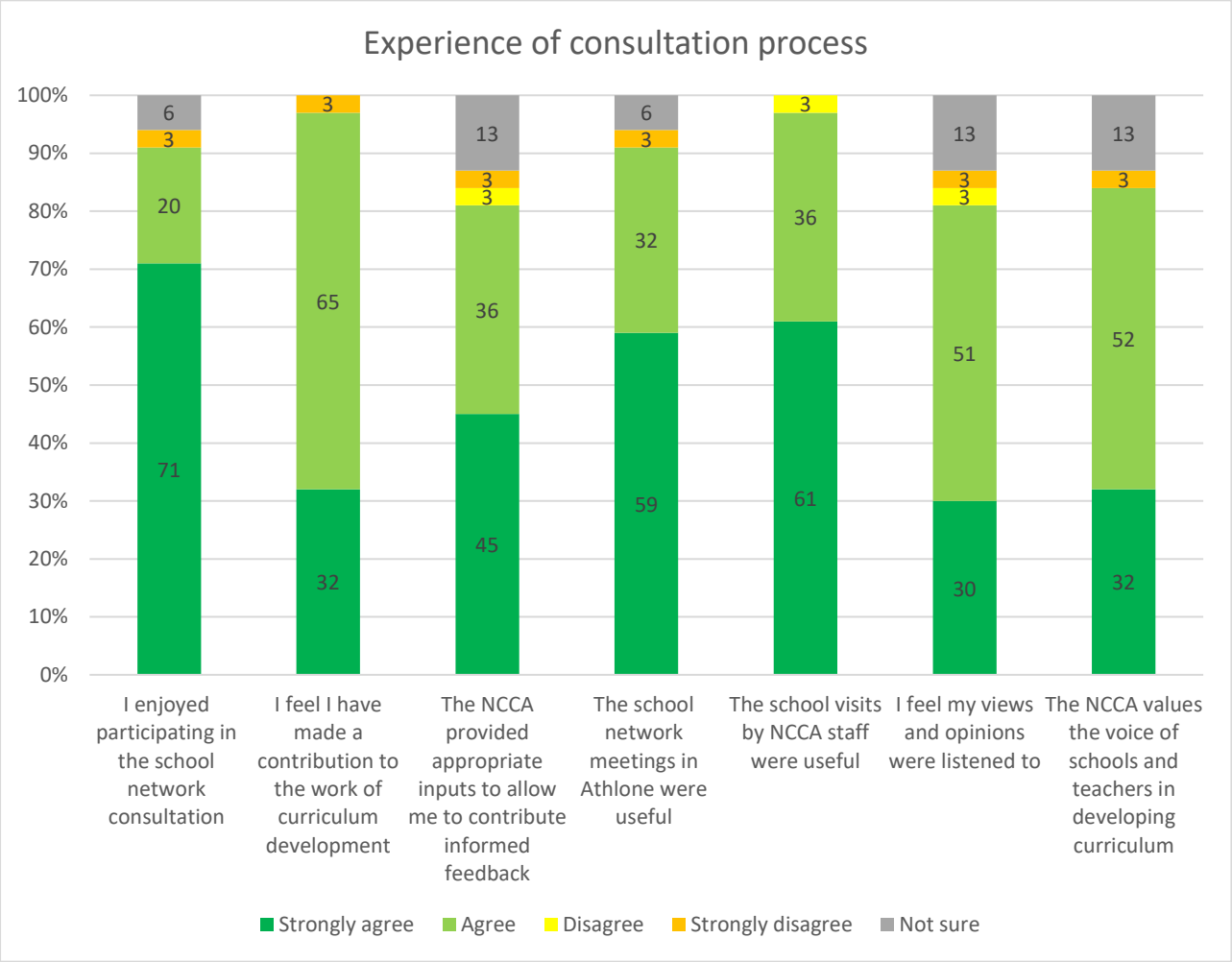
Participants expanded on their responses, with one teacher admitting that the *traditional view of maths* that they held previously had changed over the course of the consultation process, and that when considering the future and how *children will need to be more creative and be able to problem-solve more, they will need to be able to adapt and change.* They noted that the skills that they *traditionally emphasised can still be used in the open-end activities and the parallel tasks*. Another teacher reflected on the reactions they *witnessed from the children in the classroom* and how this *alongside the input from the consultation process together* changed their views. For another teacher, they shared that once they *got over the initial change and were clear on the role of the Progression Continua, it became much easier to understand and work with*.

When teachers reflected on their initial impressions on the specification, they highlighted that some of their reluctance stemmed from their experience from the new language curriculum. They noted that their *experience to date in using the languages curriculum has been difficult and when I saw a similar structure in the mathematics specification, it caused them to dislike it straight away.*

Reflecting on the consultation process, teachers welcomed the opportunity to work with other schools. Teachers expressed a view that the process was *open and honest*. One principal commented that their staff have *benefited enormously from the experience*. They found that the consultation process provided them *with an avenue to have in-depth professional discussions about the teaching and learning of mathematics*. Figure 47 presents the opinions of teachers and principals as shared in the final questionnaire with the school network. The data show a positive engagement with the process. For example, 91% of respondents in agreement that they enjoyed participating in the consultation, while 95% felt they made a contribution to the work of curriculum development.

Noteworthy, a number of schools expressed disappointment at the non-availability of any support material for the consultation process. One teacher commented that they were disappointed *not to see some of the support material ready for this consultation process, especially as it looks like they are to be such an important element of the new curriculum*. Some teachers expressed disappointment at the stage in which they have joined the curriculum development process, expressing a preference to be more centrally involved from the beginning.

Figure 47: Experience of consultation process



Related issues

During the consultation process, data was collected on issues that fall outside the remit of the NCCA. Some of such feedback received from schools relating to supports were outside the realm of curricular supports and thus are presented in this sub-section.

Schools called for more physical resources to be given to coincide with the implementation of the new PMC. Schools particularly highlighted the need for such resources in light of the emphasis on more *playful learning experiences*. They expressed a strong desire for *funding to purchase new resources*, or that *the DES design a 'maths bank' of equipment and gift one to each school*.

Schools called for a reduction in class sizes so as *to facilitate the new learning experiences as highlighted in the draft curriculum*. Some schools cited the need for teaching assistants as exist in neighbouring jurisdictions.

Teachers highlighted the need for new in-service training in relation to the new curriculum. Some schools put forward the idea of providing a week-long course where schools could send

representatives to. Such an opportunity would *allow participants become au fait with the changes and communicate these to the rest of the staff*. They also emphasised the need for continued rollout of training in the area of *Aistear*, and specifically courses which would aim to *marry Aistear with mathematics*.

Schools emphasised the need for time in relation to the future implementation of the new curriculum. Schools asked for a year to allow them *to engage in discussion amongst staff*. They also called for a rollout of a professional learning community platform during the implementation process and beyond, *where teachers could come together and to talk to other professionals outside your own school*. Schools highlighted many benefits of such a structure, with teacher would be given a chance to not only *work through difficulties* but also *to share positive experiences and solutions*.

Some schools called for planning days to be allocated by the DES. Relevantly, they also called for support facilitators who could *visit the school and focus solely on planning*.

Schools also highlighted the importance of all partners involved in the new curriculum to have strong link-up regarding purpose and messaging, from curriculum developers to support services and the inspectorate.

In the area of testing, the majority of schools called for a review to be conducted into the focus of assessment in the system. They expressed concerns as to the current role of standardised testing and *how this sits with aims and rationale of the new curriculum* and cautioned on *the emphasis being placed upon test scores*. One teacher commented that *the new focus on collaborative and social learning does not sit with the current regime of high stakes standardised testing*. Teachers also raised questions as to what learning will be assessed if these tests are to remain class-based.

Child's Voice

The findings outlined here relate to the school network strand of the consultation whereby children's perspectives on their mathematical learning experiences were gathered by teachers who had put aspects of the draft specification into practice. These experiences were planned using the draft PMC. The findings below have been compiled following comprehensive, systematic analysis of children's voice based on the artefacts gathered. Thematic data analysis has brought to light understandings of and reflections on the mathematical learning experiences the children engaged in. The following section attempts to depict these perspectives by using the children's voices.

Theme one: Active learning

"Teacher called out shapes and we all had to run to it" (Kerri, 1st Class)

A prominent feature of the children's voices was the idea of active learning. Such experiences involved activity and physical movement during learning experiences. The children's voices also brought to light hands-on, tactile experiences.

The following two children referred to a lesson in the PE hall whereby they took part in an active, engaging way. Kerri (1st class) describes this experience when she says, "*it was kind of like a maze walking around and I liked finding the shapes as fast as I could*" (see Figure 49). Reflecting on the same learning experience, Megan (1st class) recalls how she "*got really fast the more the game went on."* When referring to a number ordering activity, Leon (1st class) notes that "*we had a race to put the numbers going from smallest to biggest"* (see Figure 50). Cillian refers to the movement of standing up and sitting down for particular numbers when he says "*tá tú suí síos anseo, agus ag seasamh suas ag dó*" (sic). He has represented this movement in his drawing (see Figure 51). Evident here from the children's voices is how the children reflect on these experiences as active and involving movement.

Hands-on learning experiences also feature from the children's commentary. Some of the 2nd class children spoke about learning experiences they engaged in based on fractions, which involved the hands-on task of napkin folding and smoothie making. Children also reported on tactile learning experiences. When referring to a lesson on shape, Conor (1st class) tells us that he *"guessed [his] shape quickly by feeling the edges and corners"* (see Figure 52). Ciara (1st class) also mentions that "*we made 3D shapes with playdough."* The tactile, hands-on nature of these learning experiences are clearly evident from the children's words.

Figure 48: Kerri's drawing

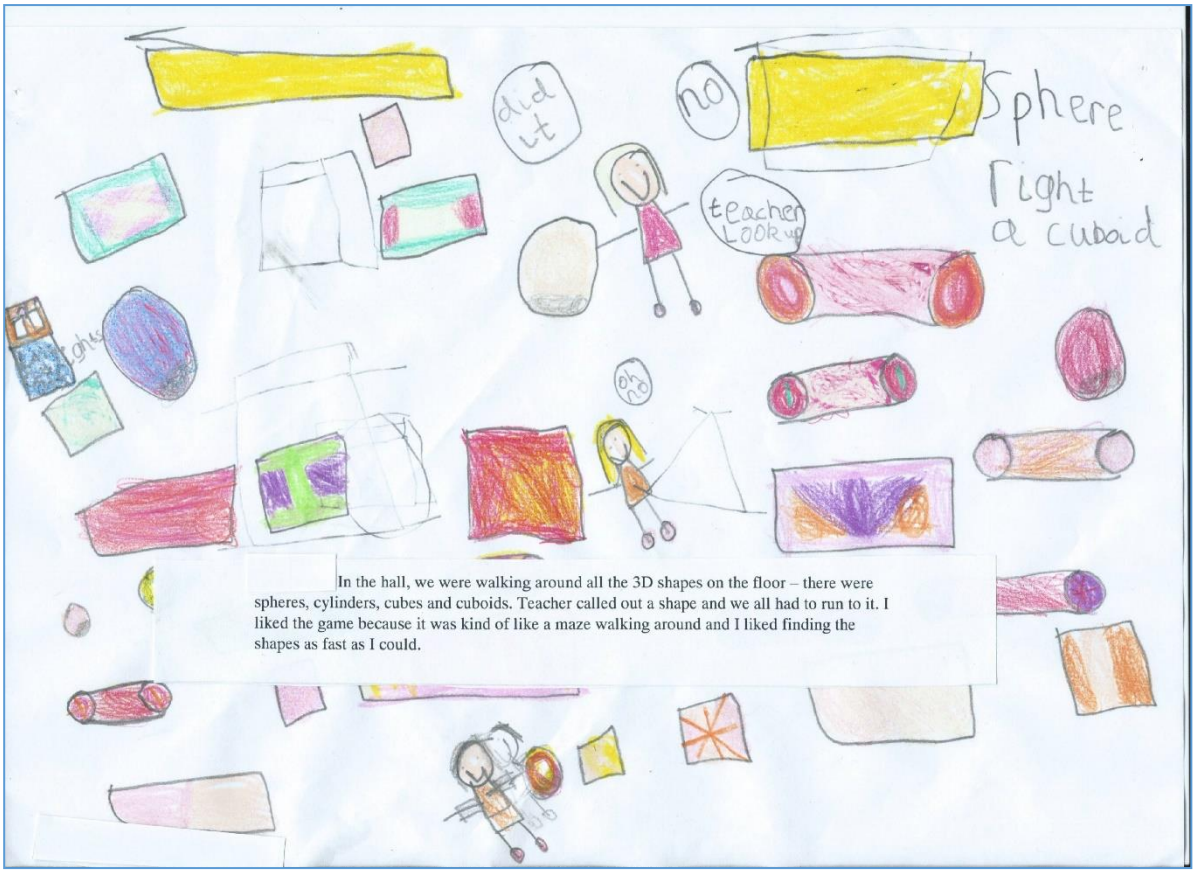


Figure 50: Leon's drawing

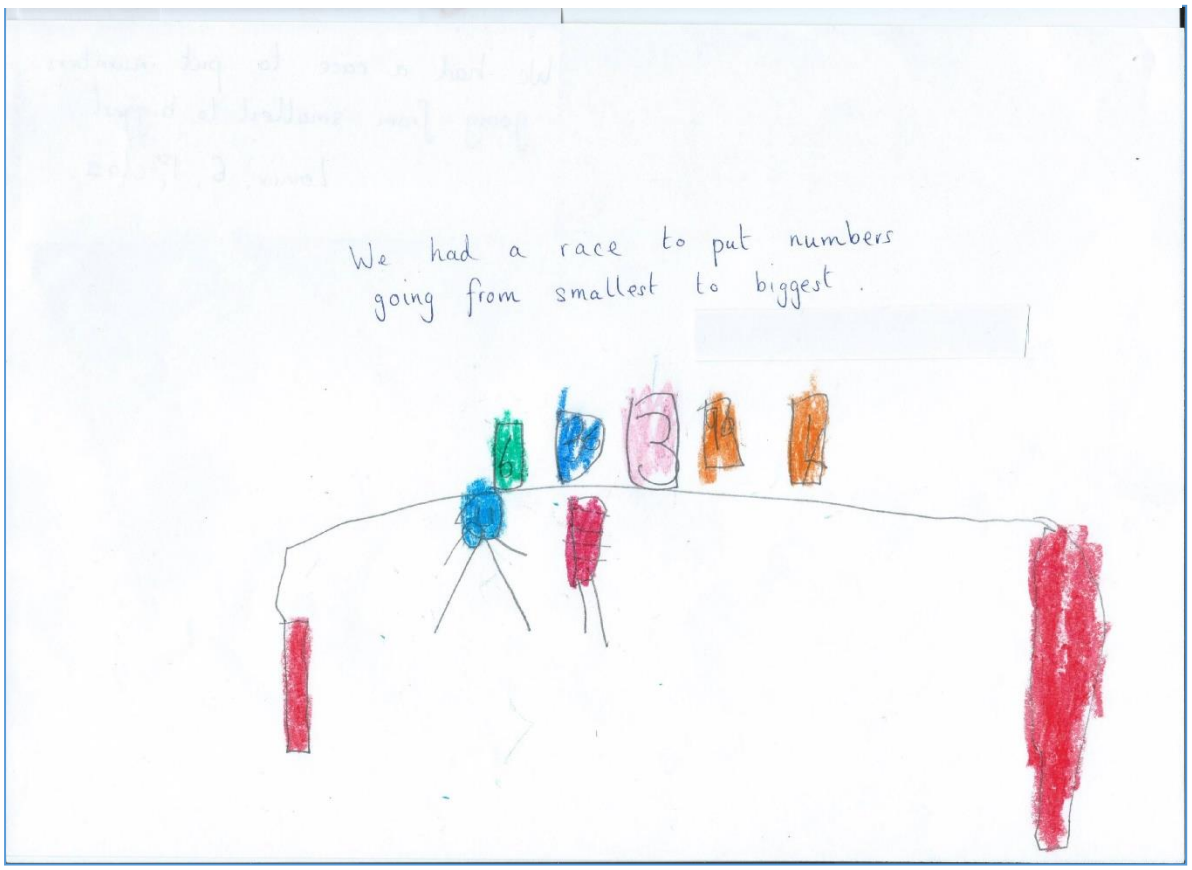


Figure 49: Cillian's drawing

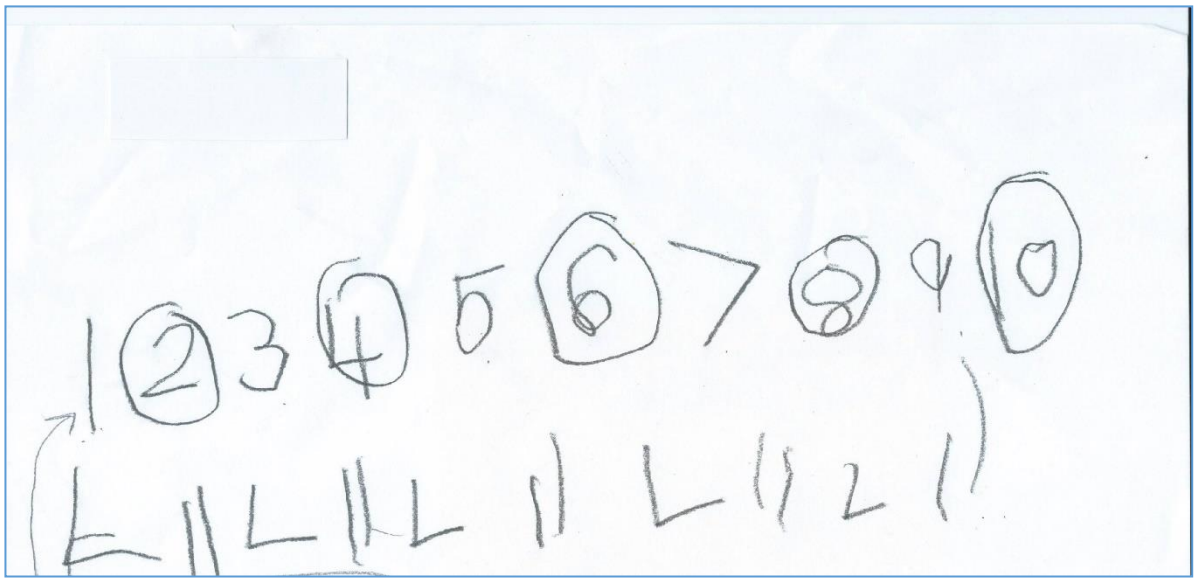
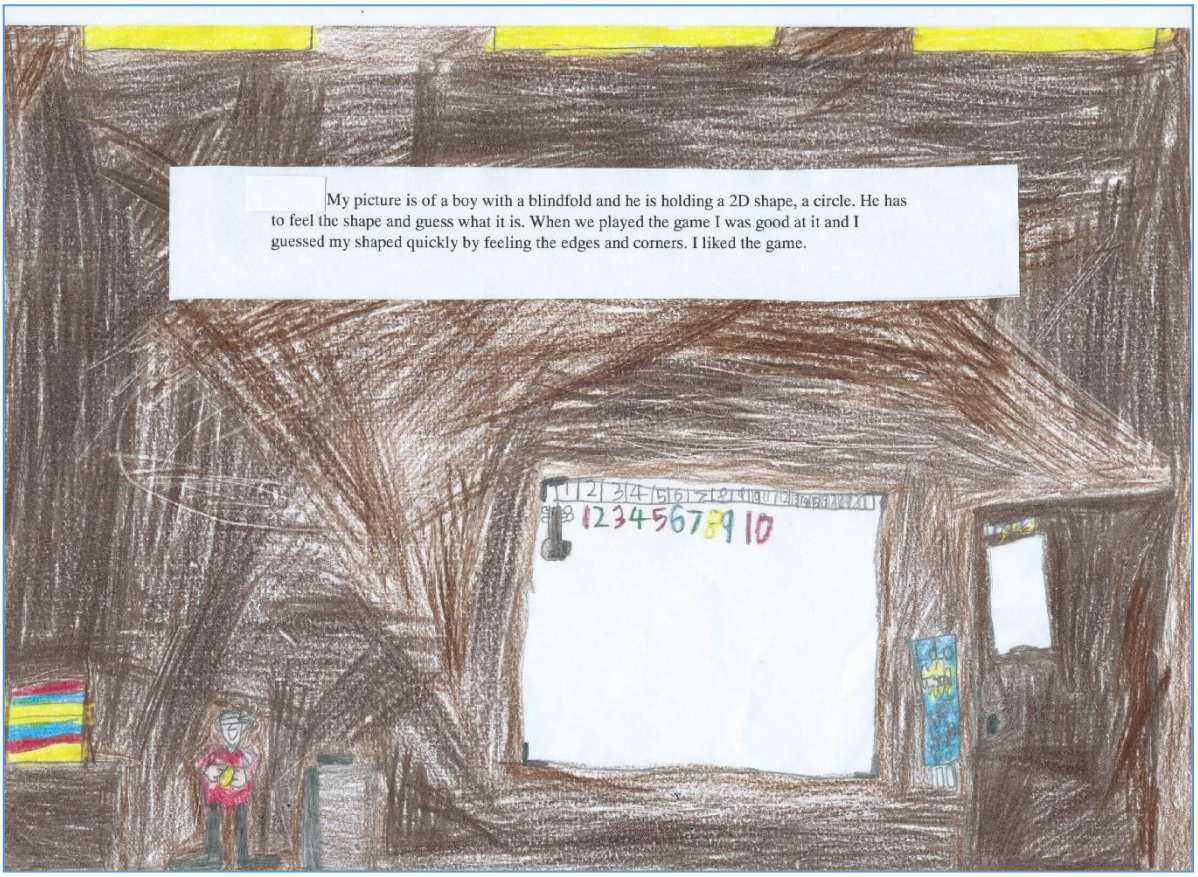


Figure 51: Conor's drawing



Theme two: Play

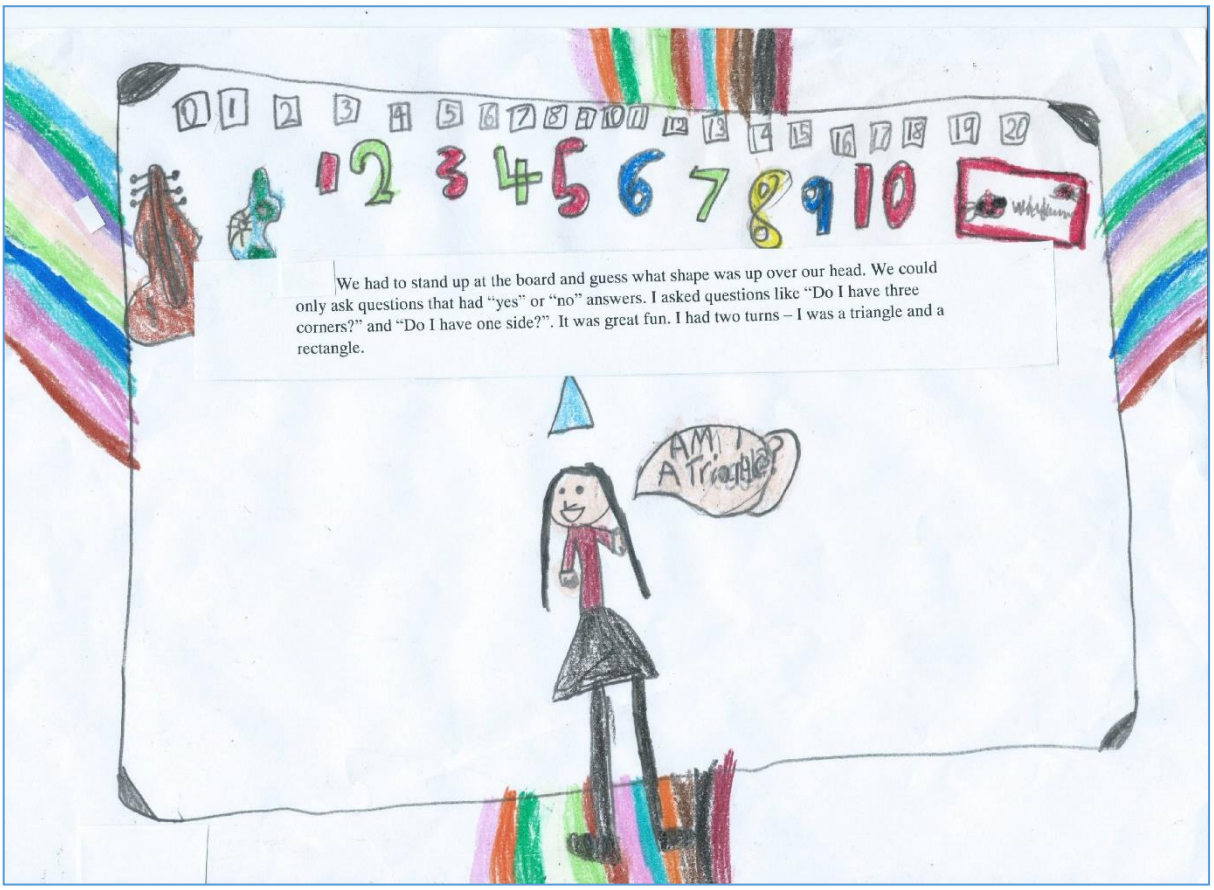
"*Bhí mé ag imirt le rhino searaf leon*" (Christopher, N. Mhóra)

Emerging from the children's voices, play and playfulness also features as a key theme. Many of the children referred to the learning experiences they engaged in as a game. This is evidenced by Aidan (1st class) who said "*my favourite game we played with the shapes was the one where teacher put a shape on the board over our heads. I got a green rectangle and a yellow triangle."* Olga, a younger student (age 5) also considers the learning experience as playful when she says "*we are doing maths time and matching game. Maths time is fun and everyone can play the same. We take cards from the table and match them*" (see Figure 53).

Figure 52: Olga's drawing

Jade recalls her learning experience and how she played with one of her classmates when she said "*bhí mé ag sugradh leis Leonie leis disc agus an huimhir a duirt an múinteoir. Chuir mé disc ar a huimhir sin*" (sic). Tina (1st class) gives a detailed description of her playful learning experience by saying "we had to stand up at the board and guess what shape was up over our head. We could only ask questions that had "yes" or "no" answers. I asked questions like "*do I have three corners?"* and "*do I have one side? It was great fun. I had two turns – I was a triangle and a rectangle*" (see Figure 54). These children's perspectives bring to light the playful, participatory nature of the learning experience planned by their teachers.

Figure 53: Tina's drawing



Theme three: Fun and enjoyment

"I like everything about maths time" (Orla, Age 4)

Experiencing fun and enjoyment was a clear feature of the children's reflections on their learning experiences. Many of the children spoke with great enthusiasm and reflected upon the active, playful experiences in a positive manner.

Jessica, (2nd class) displayed great enthusiasm when speaking about the mathematical learning experience she engaged in by saying "*I would like to play it all over again*." Similar enthusiasm was demonstrated by Juliet who says *"I love learning about numbers*" and Nathan who comments: "I love stacking cubes to see which tower is the tallest." For Carly, the independence this learning experience has afforded her is part of the enjoyment, she said "*I like doing it by myself, I like doing the race game."*

Theme four: Concrete materials and resources

"My favourite part about this lesson is when we're fold the chocolate bars in different ways" (sic) (Laura, 2nd Class)

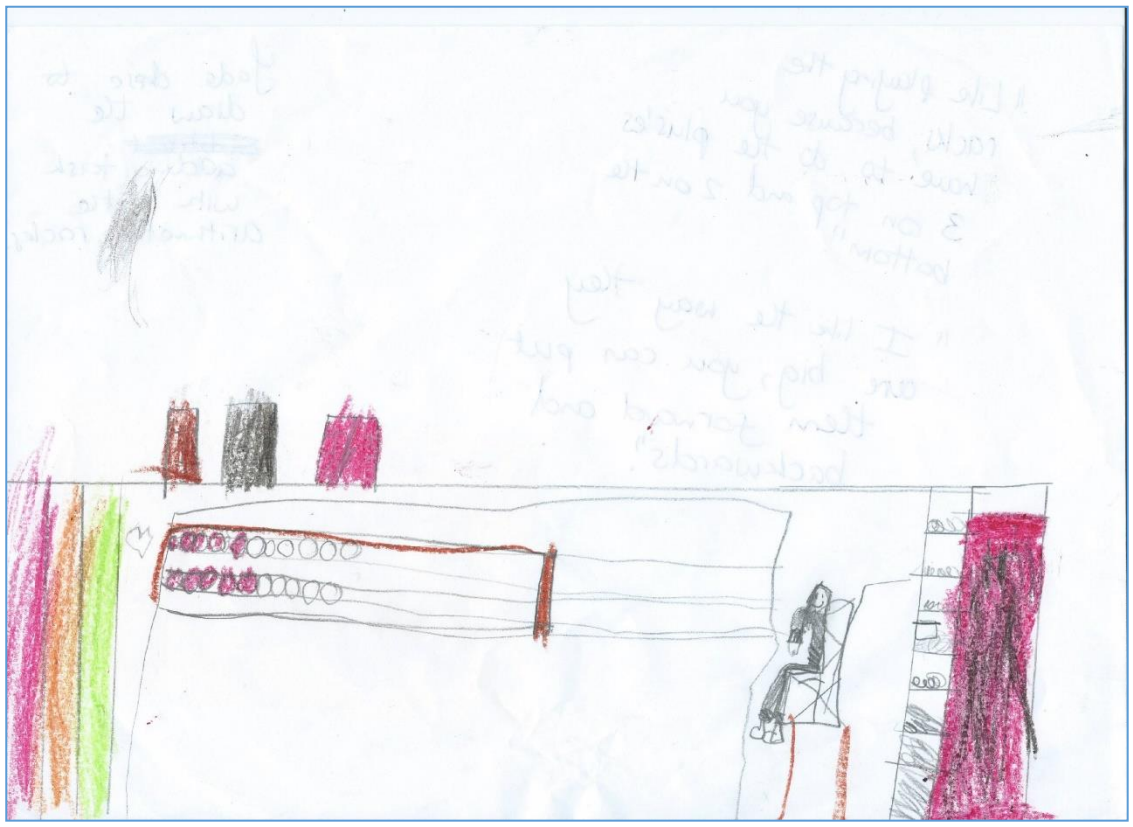
A significant number of children referred to/drew the concrete materials and resources they used during their learning experience. These included cubes, 2D and 3D shapes, animals, number cards, playdough, straws, coins, arithmetic racks, worksheets, textbooks and a computer.

For Zara (1st class) she simply "*liked when we counted in tens with the straws*" (see Figure 55). Jennifer has drawn an image of herself playing with the arithmetic rack and says she "*like[s] playing the racks, because you have to do the plusses 3 on top and 2 on the bottom"* (see Figure 56). Speaking about a learning experience involving the use of pretend money, one child had a suggestion with regard to these concrete materials stating that it would be best to "*change it to real money*" (Sam).

In relation to the use of books for mathematics, two conflicting perspectives arose. One child appeared to enjoy the experience of not using books during this learning experience and said "*it was fun to have a break from the books*" (Alex). In contrast, another child from the same class (Morgan) stated that "*I would rather do maths"* (meaning books). It appears that this child did not realise that learning activity was a mathematics lesson due to the fact that it did not involve the use of books.

Figure 55: Zara's drawing

Figure 54: Jennifer's drawing



Bi-lateral meetings and written submissions

Findings from the four written submissions and the bilateral meetings held with two education partner organisations is presented in this and the subsequent section in nine themes.

Absence of clear rationale

One submission questioned the need for a new mathematics curriculum, citing a recent improvement in Ireland's results in Trends in International Mathematics and Science Study (TIMSS). It was also noted that *the absence of a context and rationale for curriculum change is frustrating for teachers in considering proposals to change. Teachers are not convinced regarding the rationale for this shift it is not clear what theories of curriculum underpin the current language and mathematics developments e.g. curriculum as process; curriculum as outcomes or curriculum as content (Walsh, 2018).*

Engagement in consultation

While the appreciation among the stakeholder groups for the opportunity to share their input on the PMC was evident, it was also apparent that there is an appetite for feedback from other consultation processes to be made public, e.g. from consultative seminars, the online surveys and in particular to hear from schools who pilot the PMC. A concern was expressed by a number of groups regarding the inadequate notification given to teachers of the various opportunities to partake in consultations. These groups worry that this issue has had a negative impact on the chance for *meaningful engagement with the draft specification*. Greater engagement with all school types (e.g. mainstream schools and specific special schools supporting children with Autism, Visual Impairment, Hearing Impairment, Emotional & Behavioural Disorder and Physical Impairment) in the form of more consultations is strongly recommended. The extended timeframe was seen as an opportunity allowing for more comprehensive consultation with teachers on the specification, ensuring the provision of adequate time and support for teachers to engage meaningfully and professionally with the new proposals.

Inclusion

While the partner groups welcomed the focus on inclusion in the PMC, there were suggestions made to ensure greater inclusion. There is a strong recommendation that the Progression Continua must be further broken down for children in special education. It is argued that there is a significant jump from milestone A to B and this progression may take far longer than two years for some children. Another recommendation is that *the Special Education Support Service (SESS) support teachers in*

special educational settings with additional professional development for the PMC suitable for their specific contexts as was provided with the Primary Language Curriculum.

Language is viewed as a very important factor in relation to inclusion. One group recommends changing the statement that the PMC is for *all classes in primary school from Junior Infants to Sixth Class* as this excludes children being educated in alternative educational settings. Similarly, this group recommends using the phrase *children who are accessing this curriculum in their school setting where the PMC is the basis for provision* to be more inclusive. It was also noted that the challenges faced by Gaelscoileanna have not been acknowledged in this curriculum. COGG expressed concern regarding the difficulty of mathematical language and the link between this and a failure in mathematics. COGG welcomed the need stated in the PMC to support children in developing a mathematical language to promote mathematical thinking. COGG therefore recommends compiling a list of key words at the specific stages that will help develop the language of mathematics in the Gaeltacht and all-Irish settings. This would assist in the implementation of the PMC for Gaeltacht education. It is also recommended that support materials will be provided in Irish alongside any English content.

Aistear

The importance of *Aistear* was highlighted in the written submissions, with one group citing Vygotsky's (1978) research stating that children reach higher levels of understanding through play physically, cognitively and through language manipulation. It was noted that the principles of *Aistear* support continuity from pre-school to primary school. Respondents warned that it must not be assumed that all teachers are competent in the principles, themes or approach of *Aistear*'s pedagogical approach, highlighting the need for professional development in *Aistear*.

Progression Continua

While it was noted that the Progression Continua offer an increased opportunity for differentiation, a degree of uncertainty remains regarding their intention. There is a concern that progression continua will increase teacher workload. It is recommended that clear guidance is provided relating to both the purpose and use of the Progression Continua. There is a feeling from teachers that they need to be aware of where the 'average' child might be placed along the continua at each class level in order to appropriately use the Progression Continua. It is also recommended that teachers are informed that the intention of the Progression Continua is to guide and support teachers with suggested learning experiences. One group cited experience of using such a progression continuum in the Scottish education system and described the negative impact this had on the children's self-esteem.

Clarity

Clarity or the lack thereof, emerged as a significant theme across the written submissions. The language of the PMC was described as inaccessible which troubled one particular respondent as teachers are already *working in demanding and complex environments with an over-loaded curriculum* and do not have the time to decipher its contents. It was noted that the language in the curriculum should be clear in order to ensure consistency of interpretation. This extends to the language used in the Progression Continua which one group believed could be more *precise and succinct in order to eliminate any possible misconceptions*. One group questioned what is meant by *meaningful ways* as it is very vague. Others had similar complaints, particularly regarding money in the PMC. It was noted that the Learning Outcomes related to money provide teachers with insufficient detail of the learning experiences they should create, or what content to teach. Further clarification and guidance on where teachers can go for further detail was recommended.

Similarly, teachers continue to have strong reservations about a Learning Outcomes approach, with one group commenting that it "remains to be seen whether a learning outcomes approach will be appropriate to the Irish primary context". These concerns indicate a need for further simplification of the language and various opportunities for professional development to address any misconceptions that exist. This lack of clarity is worrying as some believe teachers will depend on textbooks or revert back to the 1999 curriculum for guidance. It is strongly recommended that specific, realistic and measurable Learning Outcomes are provided in order to ensure clarity for all.

Assessment

Another common theme was that of assessment, more specifically standardised testing. Schools are required to submit their standardised test results for their second, fourth and sixth class students to the Department of Education and Skills. The majority of submissions queried if standardised testing will be adapted to suit the PMC, e.g. milestone-based. This is particularly important due to the fear of accountability in reporting said results to the Department.

Heavy workload

There is a general consensus that the PMC will increase teachers' workload. It was argued that teachers are capable of assessing and differentiating with ease in the current mathematics curriculum. There is a sense that the PMC will make planning difficult, and any time that may have been saved through reducing Learning Outcomes will instead be spent navigating the Progression Continua. It is strongly recommended that teachers need more time, support and professional development opportunities to allow them to engage with the new approach to curriculum. The

curriculum should not be crowded, but should focus instead on supporting children's mathematical development.

Supports

Each of the respondents made a range of recommendations to support the effective implementation of the PMC. Such recommendations include:

- Reduction in pupil-teacher ratio
- Further consultation opportunities
- Sustained Continuous Professional Development
- Toolkit specifically for the SEN setting
- Comprehensive SEN-specific support materials (similar to SEN Pathways in the Primary Languages Curriculum)
- Sample assessment materials
- Planning tools to reduce teachers' workloads.

It is recommended that professional development for teachers in *Aistear* and other pedagogical developments should take place as soon as possible. Every effort should be made to ensure continuity and consistency across the professional development programme. Finally, as well as funding and resources to support the implementation of the PMC, teachers request an online template document to support them and their schools in planning. Such and online space could provide an excellent opportunity for the NCCA to embed high quality examples and interactive resources for teachers to access. The respondents seek clarity on the level of supports that will be available to teachers in implementing the PMC.

Parents

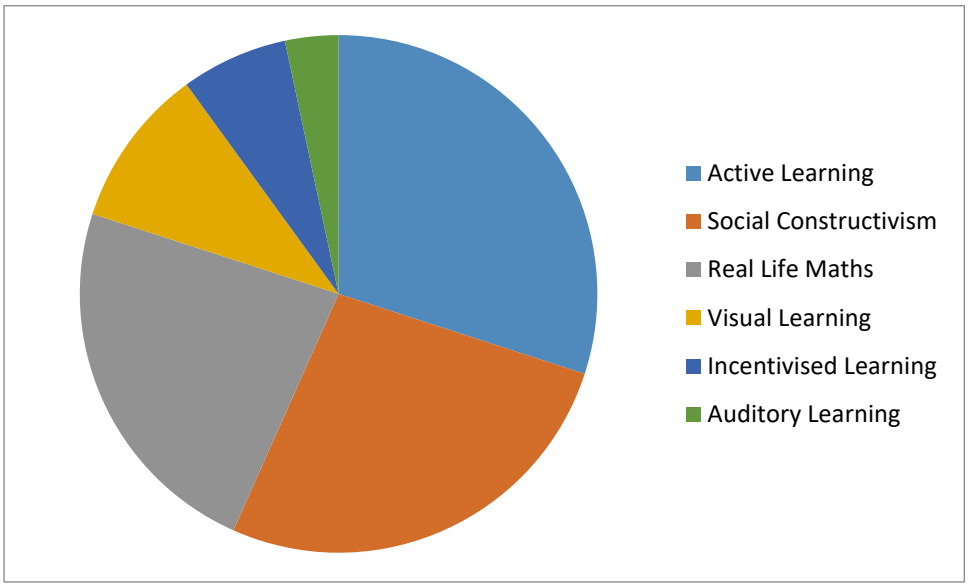
Following a meeting and subsequent feedback from the National Parents Council, the data was collated and is presented under four headings below; curriculum development and communication, recommended supports, questions and concerns.

Curriculum development and communication

How do your children like to learn mathematics?

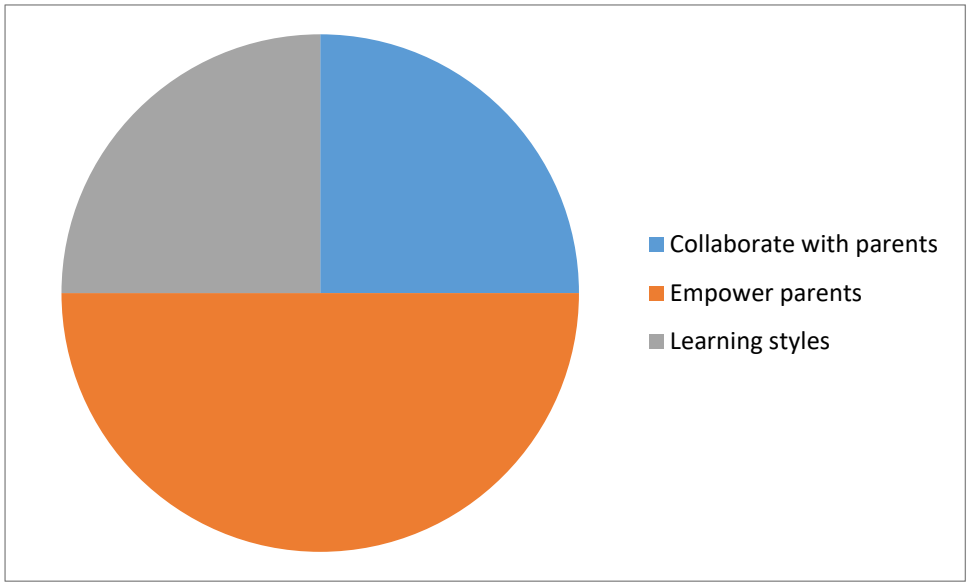
Three key themes emerged from the responses given to the question, "How do your children like to learn mathematics?" The first theme that emerged among respondents was the importance of active learning in the child's enjoyment of mathematics. A number of respondents gave examples of active learning as the practical use of mathematics, using concrete manipulation and learning mathematics through play. Another theme identified in the responses was that of social constructivism. The responses included such examples as in-class groups and social interactions with peers, as well as children enjoying their parents and siblings becoming involved in their mathematics learning experience. A third strong theme which emerged was that of real life mathematics, e.g. shopping and using a clock. Other factors which arose in the responses to this question were that of children who like to learn visually, those who prefer to learn aurally and finally those who learn better when given a reward or prize for their achievement.

Figure 56: Responses to the question *how do your children like to learn mathematics?*



How can the curriculum help parents to support their children's learning in mathematics?

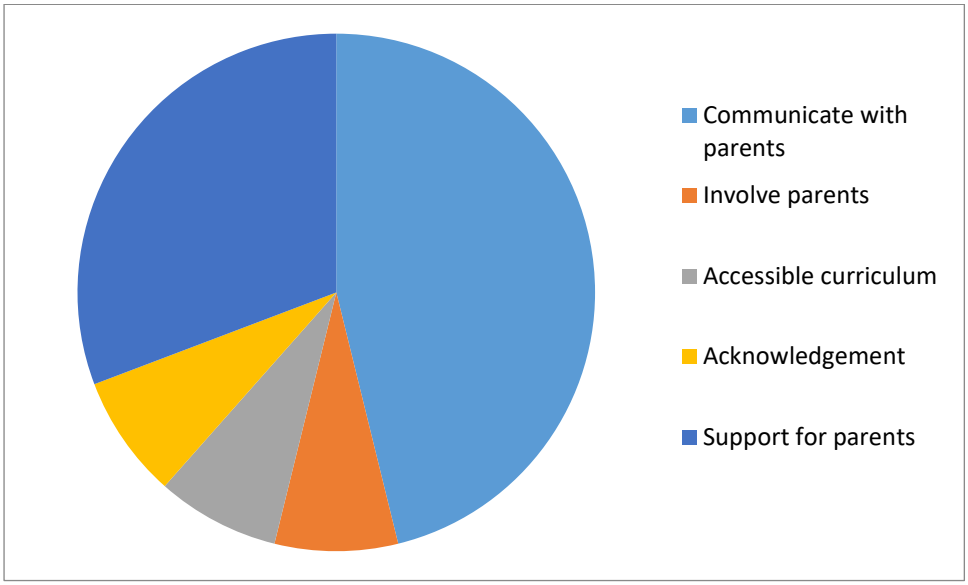
Figure 57: Responses on how the new PMC can help parents to support their children's learning in mathematics



The key idea which emerged from the responses to the question, "How can the curriculum help parents to support their children's learning in mathematics?" was that parents want to be empowered to support their children's learning. This can be achieved through acknowledging that mathematics-related fear can exist in the parent population and by ensuring parents learn the skills necessary to support their children with their mathematics work. As well as this, parents seek greater collaboration with all stakeholders and wish to see a range of learning styles and approaches being implemented in the teaching and learning of mathematics.

What are the key messages that the curriculum should communicate regarding parents?

Figure 58: Ideas around what key messages the new PMC should communicate regarding parents



It was evident in the responses to the question, "What are the key messages that the curriculum should communicate regarding parents?" communication between parents and their child's school, as well as the NCCA is of great importance to parents. Parents identified a need for clear communication with information being sent home weekly. This information appears to relate to the work being completed in the child's mathematics class that week. An individual respondent suggested that information should be put on a national website e.g. NCCA website, in order to minimise the teachers' workload. Support for parents also emerged as a strong theme in the responses to this question. Respondents reported that the benefits of doing maths games at home should be promoted and that tips and games the parents can play with their children should be provided - either online or in a physical booklet. The remaining respondents recorded the importance of involving parents in mathematics in the classroom, acknowledging the work parents are already completing and removing mathematics-related trepidation by ensuring the curriculum is accessible.

Recommended supports

A prominent theme expressed across this data collected was the need for support materials that will inform parents about the new curriculum and what parents can expect their child is learning at each learning stage. Another key theme was the need for support materials that will support the child's learning, namely how parents can support its implementation in the home, how they can help with homework and consolidate what has been taught in school in a fun way. A range of suggested supports were described to fulfil these aims, including the provision of a concise booklet for parents: 'Maths and your child'; a national maths app; a website for maths alone with a section for parents;

home-school links (either digital or paper); roadshow and support groups. There was a general consensus among the respondents that the support materials should outline the content of the curriculum, document the language being used associated with the topic and offer suggestions as to how parents can consolidate this work at home. One respondent felt such correspondence between home and school could allow for class-specific communication between a teacher and parents with the potential for the teacher to add updates about what topics they are covering. Another respondent suggested an application should be "developed by the department / NCCA to support parents and children's learning in mathematics" and it should include text, videos, audio and games.

Questions

Respondents were given an opportunity to ask questions or make comments about the new draft PMC. A number of questions could be categorised as relating to the implementation and evaluation of the new mathematics curriculum. Such questions included, *What will be the ongoing review once implemented?* and *Will the NCCA adopt an evaluative approach / reflective practice approach when evaluating this new curriculum* Some respondents were concerned about evaluating the impact this new draft PMC may have, asking …*how will it be shown whether this is working and improving learning? and If this fails, what will you do*? Others queried the potential negative impact on children if this curriculum is introduced midway through their primary education, while another questioned if parents will be included in all ongoing evaluation of the new curriculum. An individual respondent questioned what obligation is on teachers to implement the new curriculum, if it is only a guide, while a final individual respondent questioned if the NCCA had considered the concerns outlined by opponents to the implementation of the new draft PMC.

Another theme which emerged in the questions was that of assessment, in particular in relation to standardised testing. Respondents wonder what role standardised tests will play in the new curriculum and if standardised tests will be revised to reflect new methods of learning in maths. One respondent argued that children be encouraged to answer questions in a variety of ways to communicate their answer, especially in a testing situation.

Some respondents questioned the level of involvement and support parents will have regarding the new curriculum. Some asked how the NCCA intend to communicate the curriculum to parents while another individual respondent asked if the NCCA will provide support materials and games to assist parents in reinforcing mathematics concepts at home.

A small minority of respondents questioned how high achievers will be catered for within the new draft PMC, while others questioned the level of continuity between primary school and junior cycle mathematics.

Concerns

A number of points arose relating to implications for practice of the new draft PMC. Firstly, a respondent argued that *Aistear or the fundamental elements of play should continue to classes higher than senior infants*. Another participant praised the *Aistear* model, while also strongly recommending a focus on the *development of mathematical language all the way through primary school*. A third respondent noted the role play has in *fostering life-long love of learning* which the respondent argues is negated by testing. The final implication for practice recorded related to class sizes and the need for funding for resources *in order for children to get the best out of the curriculum. This will ensure it is taught correctly and effectively*.

Another reported problem was the belief that the new draft PMC is not inclusive of parents. Some suggestions to combat this include using social media to involve parents, create more resources to be made available online to support parents and send surveys to the National Parents Council who can distribute them to more parents, ensuring wider parental involvement.

A number of cautionary comments conclude this piece. Homework continues to be a worry to parents and children, as is the fear of mathematics which one respondent feels can be eradicated by the message portrayed by this new draft PMC. Finally, there is a concern that it may be harder to evaluate a child's mathematical performance with this new curriculum.

Chapter 4. Discussion

The following key discussion points are grounded in the findings from the consultation presented in the previous chapter. In this section, key considerations in terms of the specification, teaching and learning with the draft curriculum and curriculum supports will be outlined.

The specification

Key features

As evidenced in the previous chapter, stakeholders appear to welcome the development of mathematical proficiency as the aim of the new PMC. Having worked with the specification and engaged in the consultation process, teachers in the school network overwhelmingly agreed (94%) that the new PMC will help children develop mathematical proficiency. This compared with 42% of respondents to the online questionnaire, indicating a significant divergence. As recommended in the research reports (Dooley et al., 2014; Dunphy et al., 2014), the five aspects of mathematical proficiency are embedded within the Progression Continua, where mathematical content and processes are described. Across much of the data collected, respondents highlighted the need to give greater prominence to the five aspects of mathematical proficiency within the specification. Teachers in the school network specifically called for exemplification as to what these aspects would look like in the classroom, particularly productive disposition, which was especially welcomed by respondents. As development continues, it is clear from the consultation process that further exemplication and explanation of the aims of the curriculum will be required.

In addition, there was strong consensus from the school network for the meta-practices to be fore-fronted within the specification. These overarching practices were identified in the research reports as the promotion of maths talk, the development of a productive disposition, an emphasis on mathematical modelling, the use of cognitively challenging tasks, and formative assessment. These meta-practices were welcomed by the school network. Teachers strongly expressed a preference for the meta-practices to be explained, exemplified and placed alongside the Learning Outcomes to reinforce their importance and present the meta-practices as new pedagogical focal points.

The rationale of the new curriculum presents mathematics in the context of children's learning and development. As highlighted in responses to the online questionnaire and reinforced by the feedback from teachers in the school network, there is a strong need for the curriculum to articulate in a clearer manner how this rationale has influenced the development, design and presentation of the draft specification. The online questionnaire provided evidence that the rationale for changing the curriculum will need to be communicated more effectively with schools and elsewhere. While, comparatively, teachers in the school network demonstrated a stronger level of agreement with the rationale, this may be due to opportunities to interrogate the rationale and context for change to the curriculum.

Of major importance to the further development of the specification is its translation. Teachers representing schools teaching through the medium of Irish expressed concern at the complexity of Irish used in the Leagan Gaeilge, and asked for teachers to be more centrally involved in the translation process. Further ideas to help clarify and exemplify the language in the specification and support enactment of the curriculum in Irish-medium schools were gathered and these will feed in to the next phase of development.

Inclusion

A critical brief of the new PMC, as detailed in the Background Paper (NCCA, 2016), is the importance of ensuring that the curriculum specification is sufficiently inclusive for all children, with explicit reference to the promotion of inclusion, equity and access as a guiding principle for developments. In accordance with the principles of Universal Design for Learning (UDL) (Meyer, Rose & Gordon, 2014), the draft specification has been designed from the outset with the learning needs and experiences of all children in mind. By omitting class level delineations of learning and describing learning according to Learning Outcomes and progression steps, the specification aims to ensure that children with diverse and/or additional needs are included in a meaningful way. The specification aims to promote a vision for children's learning in the classroom that is aligned with their ability, readiness and individual circumstances.

The consultation process provided diverse and often contradictory views on the issue of inclusion. Notably, participants at the consultation seminars identified the new curriculum as a key opportunity for improving inclusion for all children. However, there was little evidence of consensus among respondents that changing the structure of the specification for the purposes of inclusion was a strong enough justification.

The language in Milestone a was highlighted as an area that required further changes, with the use and repetition of verbs cited as areas for revision. Teachers working in SEN contexts also called for Milestone a to be broken down further in either the support material or the specification itself. Contrastingly, other teachers cautioned against altering the verbs that are currently used, as doing so may exclude some children.

A persistent view expressed during the consultation pointed to a need for the NCCA to outline, in specific terms, the expected learning for children at different class levels. Surprisingly, in this context, there was little reference made to the fact that Learning Outcomes describe expected learning at the end of Stage 1 (senior infants) and Stage 2 (2nd class). The removal of class-based objectives or delineation of curriculum content was highlighted by many as a concern, with those respondents expressing a preference for more specification as to what should be taught to specific class levels. Negative feedback on this aspect of change to the curriculum was largely expressed by teachers in large or medium sized schools. Feedback from special education settings and from teachers and principals in small multi-grade settings generally indicated that the new draft curriculum was more reflective of the curriculum planning, teaching and assessment needs of practitioners within these settings. Some respondents also highlighted the useful nature of presenting the specification without class levels assigned, citing increased professional freedom and autonomy.

It is apparent from the findings that a significant tension and challenge for development exists in striking a balance between providing an appropriate level of specification and support for teachers, whilst simultaneously preserving an appropriate level of teacher autonomy and agency. Concomitantly, in mediating this challenge, it will be important that the commitment to provide an inclusive curriculum for all children will be maintained. In accordance with the guiding principle to develop an inclusive PMC, ongoing development of the specification will aim to ensure that barriers to the inclusion of all children are removed or reduced, insofar as possible, whilst also providing support to teachers in mediating the curriculum and providing for effective learning experiences for all children.

Learning Outcomes and Progression Continua

Respondents across the different strands of the consultation identified Learning Outcomes as a significant change in how curriculum is presented. Issues surrounding the broad nature of the

Learning Outcomes and the level of confidence teachers perceive they will have in working with them arose strongly across the strands of consultation, with many teachers describing them as *too vague*. It is well highlighted in international literature (for e.g. Park & Sung, 2011; Troudi & Alwan, 2010; Mellegard & Dahlberg Pettersen, 2016) that teacher confidence presents a key consideration for curriculum and policy makers. To help strike a balance between keeping the Learning Outcomes sufficiently broad to avoid over-specification but also to provide sufficient detail for teachers, a further breakdown of the core mathematical concepts contained within each learning outcome emerged as a possible solution from the school network. Feedback from the schools strongly indicated a need for the Learning Outcomes to be fore-fronted within the specification to emphasise their primacy.

Consistency with the post-primary mathematics curriculum and increased autonomy for teachers were identified as some of the advantages of using Learning Outcomes. Consistent and clear messaging around the role of Learning Outcomes has been actively called for, particularly from the school network, which expressed strongly the need for this to be relayed and shared with schools at professional development events and in advance of curriculum implementation. These teachers also called for guidance as to how they might interrogate and negotiate Learning Outcomes for planning, teaching and assessment purposes. Once teachers in the school network identified the Learning Outcomes as the starting point for planning, teaching and learning, there was a greater level of acceptance and confidence in working with them. Much of the feedback on planning also centred on promoting the central role of Learning Outcomes for planning, for teaching and mathematics learning experiences in the classroom.

It is clear that considerable debate is also present in the system around Progression Continua. Findings from across all strands point to lack of consistency as to how they are being interpreted in schools. Respondents consistently reported frustration and concern at placing children or classes on milestones, and the fear of the 'extra workload' and 'paperwork' this might bring. The positioning and perceived primacy of the Progression Continua within the specification emerged as a probable cause of confusion and misunderstanding for respondents. Such aspects of the specification need to be further explored to mitigate against the difficulties and genuine frustration expressed by many teachers. The clarity of language in the Progression Continua also emerged as an issue for many respondents. Given the inconsistencies which emerged, messaging as to the role and function of the Progression Continua will need to be made explicit and communicated well. Working with the school network over the course of the consultation provided an opportunity to ask participating teachers for their recommendations and guidance on how the intended use of Progression Continua might be

communicated effectively to teachers, parents and schools. These can now be explored further in continuing developments. Similarly, it was noted across the feedback that a number of teachers critiqued the extent to which the PMC helps with identifying appropriate starting points for children's learning, for example at the beginning of the academic year. Formative assessment was referenced by a minority of teachers as a tool which could address this challenge, but calls followed for substantial guidance and support to be provided to teachers in this area. Given the central role that formative assessment will play in mediating learning outcomes, the findings suggest that supports attending the curriculum will need to help teachers in exploring possible starting points for planning and teaching in their classes at the beginning of the academic year.

Teaching and learning

Evolving perspectives

The various strands of the consultation provided for a wide range of perspectives on the draft PMC and for rich discourse on foundational, practical and developmental aspects of the curriculum. The large volume of responses to the consultation questionnaire offer a comprehensive insight into teachers' initial reactions and perspectives on the curriculum as they grappled with the key messages, aims and rationale underpinning the new curriculum. The questionnaire and consultative seminars also offered insights into the considerations and concerns held by teachers as to how the curriculum might be actualised in practice and what implications this may have for planning, teaching, assessment and differentiation in classrooms. Without exception, teachers were unequivocal on the need for provision of suitable professional development and a suite of curriculum support materials to aid teachers in adopting the new PMC and to support and stimulate curriculum enactment in classrooms.

While findings from other strands of the curriculum echo some of the reservations held by teachers in the questionnaire, the findings from the school network strand demonstrate in a striking way the evolution of teachers' perspectives as they engaged with the consultation process over a period of five months. The addition of the school network strand to the consultation provided an opportunity to engage with teachers as they navigated and interrogated the specification. What emerged from this process was a shift in teachers' perspectives on the draft curriculum.

The reflection activity held with teachers from the school network on the final gathering (see Table 7) with schools is indicative of how teachers' perspectives changed over the consultation period. Many teachers described their initial reactions to the curriculum as negative e.g. 'overwhelmed', 'worried', 'confused' and 'frustrated'. However, their reactions at the end of the consultation process contrasted strongly with these initial views, with teachers describing themselves as 'optimistic', 'informed', 'enlightened' and 'calmer'.

Notably, findings from the questionnaire indicate that up to 88% of respondents described the rationale for change to the PMC as unclear. When the same question was posed to the school network at the end of the consultation, 74% of the teachers described the rationale for change as clear. Comparatively, teachers from the school network strand expressed how the curriculum became easier to understand and work with once they held a clearer understanding of the rationale behind the new curriculum, and the structure and role of curriculum components were explained. This comparison between the questionnaire responses and the school network emphasises for NCCA the need to redevelop the current draft so as to provide all teachers with the clarity achieved through the work with the school network. A further consequence of the work of the school network was an enhanced understanding of the messages about teaching and learning in the draft PMC. Other teachers expressed how a critical impetus for the shift in their perspectives came from their experience in witnessing the impact of the new curriculum on children's learning in their own classrooms.

Children's learning experiences

The perspectives shared by children in the school network provide a window into the lived experiences of children's mathematical learning with the new draft curriculum. While data was not collected on children's previous learning experiences, the findings describe, in the children's own words, their experiences when aspects of the draft PMC were put into practice in their classroom. Taken together, these perspectives depict fun and enjoyment as a clear feature of children's learning experience with the curriculum. Analysis of children's voice found that many children spoke of their learning experiences with positivity and enthusiasm. Play and playfulness emerged as a key theme from children's voices, with many children reflecting on their learning experiences with the new curriculum as a game and highlighting the playful, participatory nature of learning promoted in the curriculum. Children's reflections also described learning as an active process involving movement, with their words and illustrations portraying a sense of hands-on and tactile learning.

A significant theme which emerged from children's images and words was reference to concrete materials, resources and manipulatives as part of learning with the new curriculum. Another discussion point emerging from the data was the contrasting perspectives on the absence of textbooks in lessons, with one child describing the break from textbooks as 'fun', whilst another child failed to identify their learning as 'maths' without the involvement of textbooks. Going forward, further exploration, especially with older children, will be needed to understand how the characteristics of mathematics learning expressed in this phase relate to mathematics learning throughout the school.

The findings from the child's voice strand of the consultation correlate strongly with the views held by parents as to how their children like to learn mathematics. Parents stressed the importance of active learning, play and the practical application of mathematics as key to supporting their children to learn best in mathematics. They also stressed the importance of promoting mathematics as enjoyable and useful in 'real life'. Moreover, parents emphasised the importance of catering for various learning styles when teaching mathematics in primary classrooms.

Curriculum supports

Pedagogical support

A wide volume of responses to the consultation relate to implications of the proposed curriculum for teaching in classrooms. To support teachers to enact the curriculum in classrooms, participants were insistent on the need for a comprehensive teacher toolkit which would provide assistance and guidance to teachers as to how the curriculum would be actualised in practice and exemplification of the kinds of learning experiences that the curriculum intends to engender. A number of teachers and schools welcomed the opportunity that the new curriculum presents in addressing what was described by many teachers in the consultation, as the over-reliance on textbooks. A well-resourced teacher toolkit was seen as a positive alternative solution in providing additional support for teachers to enact the intended curriculum in their classrooms and to ensure that teachers did not revert to the over-use of textbooks. Notwithstanding, it is somewhat surprising that little evidence was found of awareness of or familiarity with the support materials that are available on the Primary Language Curriculum Supports for Teachers website, and as such, concerted effort will need to be made to ensure that schools are aware of such supports.

The lack of assessment guidelines in the new specification was highlighted by teachers as an issue with a large number of teachers calling for dedicated support materials for assessment, summative and formative, with the caveat that constructive feedback is crucial to the learning process. Clearly, planning is a key concern for teachers that must be addressed in ongoing development. Furthermore, a number of schools called for more support around pedagogy. These schools felt that the new curriculum presents a great opportunity to allow teachers reflect on how they are teaching mathematics and encourages teachers to provide children with a positive learning experience. Teachers and schools responded positively to the meta-practices discussed at consultative events and expressed a wish for the support materials to forefront these new pedagogies and new ways of looking at mathematics

The references to *Aistear* and play indicate that there is a multiplicity of understandings in the system as to what the stem 'Through appropriately playful learning experiences, children should be able to' means or would look like in practice. The frequent references to '*Aistear*' as an activity suggests that it is being used as a synonym for 'play', but the actual activities described are not necessarily what is understood as play in the early childhood scholarship or in *Aistear*, the Early Childhood Curriculum Framework (NCCA, 2009). The point is frequently made that no national CPD has been available to support a pedagogy of play, and it is therefore understandable that multiple interpretations have emerged. However, it is also clear that there is considerable support for such approaches to teaching and learning, at least in the infant classes, and findings from the school network are particularly illuminating on this point.

Supporting parents

The importance of parental involvement is evident in the Education Act (1998) wherein the National Parents Council received statutory recognition for its input into national policy (Government of Ireland, 2018). The questions and comments posed by parents to the NCCA executive during the consultation suggested that parents were mainly concerned with how the curriculum would be implemented and evaluated. The role that standardised testing would play and the potential difficulty of evaluating children's mathematical performance with the new curriculum was particularly referenced. They also queried what changes would mean in terms of their children's experience in the classroom and also the level to which parents would be included and supported as changes were introduced. A significant majority of the parents consulted expressed the view that *Aistear* or playful learning experiences and mathematical language development should be

promoted beyond the infant classes in order to foster a more positive experience of learning for children. This is a particularly interesting point of feedback for further exploration, especially with reference to teachers' perspectives on the appropriateness of playful learning, especially with older children. While parents feel that homework remains an area of concern for parents, they welcomed the potential for the new curriculum to eradicate children's fear of mathematics. The parents consulted also recommended a number of measures to keep parents included and engaged as changes are introduced to the curriculum, particularly through the use of social media and curriculum support materials for parents such as tip sheets, apps, and games.

Key recommendations derived for consultation with parents point to important considerations in terms of messaging within the specification itself, the provision of dedicated curriculum support for parents and also the importance of including parents in future developments. Given that parents play a key role in supporting their child's progress throughout their schooling, empowering parents to support their children learning in mathematics is key to successfully establishing the new curriculum in practice.

External factors

During the consultation, a number of issues were raised by participants that constitute factors external to curriculum development and essentially outside the remit of the National Council for Curriculum and Assessment, but that nonetheless participants viewed as having a substantial influence on how the new curriculum might be adopted by teachers, schools, parents and children.

When presented with the opportunity to pose questions and comments through the various strands of the consultation, a persistent concern/view voiced by teachers centred on uncertainty and ambiguity as to what expectations there would be of schools in terms of accountability, planning and assessment. In particular, teachers expressed concern about possible inconsistencies between curriculum intentionality and whole school and curriculum inspections in schools. Furthermore, teachers expressed fears of an increase in the volume of paperwork and also an increase in the amount of time that may be required to assess and 'track' students with the new curriculum.

Given that the vision for children's learning promoted in the curriculum may necessitate a shift in teaching practice and/or the initiation of some of the research-based meta-practices described in the research reports (Dooley at al., 2014; Dunphy et al. 2014), teachers stressed the importance of professional development opportunities to develop their professional learning to equip them with

the necessary subject-matter and pedagogical content knowledge to enact the curriculum in their classrooms. In particular, teachers pointed to the need for school-based professional development and facilitated professional conversations and collaboration within schools so that teachers negotiate and internalise the changes involved at a local level and bring to life the aims and goals of the primary curriculum.

The establishment of professional learning communities network was identified in the consultation as a possible support for the roll-out and enactment of the new PMC. Such communities have become increasingly popular in recent times as they are an effective way to increase collaboration and improve learning experiences and outcomes, thereby having a transformative impact on teaching and learning in schools (DuFour, 2004).

A concern expressed by both parents and teachers was the influence that standardised testing may have on the degree to which the curriculum will be adopted by teachers and schools as intended. Parents were particularly concerned that only the kinds of knowledge and skills that would be assessed in standardised tests would be prioritised by teachers in classrooms, at the cost of aspects of mathematical proficiency promoted in the new curriculum such as productive disposition (children's enjoyment and confidence in mathematics). Many teachers from the school network stressed the criticality of ensuring that standardised tests are consistent in assessing the wide range of mathematical skills evident in all elements of the PMC.

Many teachers also expressed concerns relating to class size and the need for appropriate funding and resources to support the enactment of the curriculum. Particular reference was made to the provision of digital resources and infrastructure, given the anticipation that the teacher toolkit will largely be hosted online. A small number of teachers queried the role that textbooks and publishers may play in the new curriculum.

Conclusion

Summary of key recommendations for developments

Arising from the consultation findings, the following key recommendations have been derived for the (continued) development of the junior infants to 6th class PMC. These are presented under eight broad headings.

Messaging

- The context and rationale for change to the mathematics curriculum should be clearly communicated to stakeholders.
- The role of specification components, particularly Learning Outcomes and Progression Continua, needs to be outlined in a more coherent manner and support materials for how these components might be used by teachers in planning for, and providing rich mathematical experiences for children should be provided.
- The purpose of the curriculum in supporting all children's learning in mathematics should be clearly articulated, together with a clear outline of key features of the curriculum that enable this.
- The leagan Gaeilge of the PMC should use a language register that is accessible and more easily understood by teachers working in scoileanna sa Ghaeltacht agus Gaelscoileanna.
- The inclusivity of the specification should be reviewed, particularly in relation to milestone a and the language register used to describe children's learning experiences.

Learning Outcomes

- The physical presentation of Learning Outcomes should be emphasised and highlighted to reflect their function as the central component of the PMC.
- Guidance should be provided on how to use Learning Outcomes as the primary focus for planning, teaching and assessing learning in the classroom.

- To mitigate concerns about the removal of class-based learning objectives and enhance their usability for teachers, Learning Outcomes should be reviewed to include a greater level of specificity as to the core concepts which underpin each Learning Outcome.

Progression Continua

- The positioning of the Progression Continua within the specification should be reviewed with a view to better emphasising their role as a support for teaching and learning.
- The specification must be clearer in its messaging about the role of both the Learning Outcomes and the Progression Continua in both planning for and assessing children's learning in mathematics.
- The language of the Progression Continua should be reviewed to ensure it is succinct and accessible for teachers.

Mathematical proficiency

- Mathematical Proficiency should be presented in a more substantial and expanded way, with increased clarity about the five aspects and their inter-relatedness.
- Examples should be provided to help illustrate how the five aspects of mathematical proficiency can be developed through classroom experiences.

Supporting pedagogy

- Pedagogical approaches, including play and playful teaching and learning, need considerable exemplification.
- The meta-practices, as outlined in the research reports, should be fore-fronted in the specification to illuminate the proposed changes and provide support for a fresh vision for pedagogy in primary mathematics.

Support material

- A comprehensive and well-resourced teacher toolkit should be developed to support the enactment of the curriculum specification. This includes support material for teachers, examples of children's learning in the classroom, and supports for parents.
- Support material and examples should be developed which reflect the diversity of school contexts including special schools and Irish-medium schools.

Consultation

- Support materials should be included in the next phase of consultation.
- The perspectives of children should receive greater focus and attention in the next phase of consultation.

Supporting change

Introducing curriculum change and reform is often complex. The consultation on the draft PMC provided a number of key insights and considerations for supporting teachers, parents, schools and children to embrace curriculum change and in doing so, to work with a mathematics curriculum that differs in some significant ways to the 1999 mathematics curriculum. The evolving perspectives evident from the consultation clearly demonstrate the types and degree of support needed for teachers, parents and schools to facilitate change. The development of a comprehensive teacher toolkit is essential to support teachers in using the curriculum to provide the rich learning experiences for children that are promoted in the curriculum. Guidance on planning, teaching, assessment, playful learning and differentiation will be critical supports for teachers, as well as the exemplification of children's learning across the mathematical strands. Given the changes involved in the new curriculum, teachers also require professional development opportunities that will facilitate them to interrogate, negotiate and internalise the new curriculum aims, rationale, principles and layout for their own practice at a local level.

To support the enactment of the curriculum, teachers and parents also require reassurance that the standardised testing will align and reinforce the aims and principles of the new PMC. Equally, teachers will need clarification from the inspectorate as to what might be the expectations of teachers and schools in terms of planning, assessment and paperwork to meet accountability measures in demonstrating curriculum implementation.

Consultation on the specification for junior infants to 6th class

Given that the experiences of children in the consultation strongly reflect the intended learning experiences promoted in the draft primary curriculum, it would be beneficial to include a broader cohort of children's voice in the next phase of consultation on the draft curriculum from junior infant to 6th class.

In the consultation, teachers and parents highlighted the critical importance of the teacher toolkit in supporting teachers to adopt the changes proposed in the new curriculum and to enact the new curriculum in practice. Accordingly, it would be of benefit to use the opportunity for a further consultation to provide a basic set of support materials for teachers with the draft specification from junior infants to 6th class, and to gather feedback on the usefulness and applicability of these support materials.

Next steps

Drawing on the consultation findings, work will continue on the development of the draft specification and with a focus on junior infants to sixth class. It is hoped that a draft of the curriculum for all eight classes will be approved for consultation by the end of 2018 with consultation taking place into Spring 2019. As per the DES revised timeline for primary mathematics, the specification for junior infants to sixth class is due to be published in Autumn 2019.

The NCCA would like to extend a special thank you to everyone who contributed to the consultation process. To the principals and teachers in the school network, to everyone who completed the online questionnaire, to those who attended the public consultative seminars and to all the stakeholder groups who contributed or helped facilitate events, we thank you all for your time and considered feedback.

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Appendix A - List of Figures

Appendix B - List of Tables

Appendix C – Key Development Milestones

2014/2015	Research Reports x 2
	Audit
	Conference launch
2016	Background paper and brief published
	DG convened and inducted
2017	Draft approved by Council for consultation
	Consultation commenced
2018	Consultation concluded
	Consultation report drafted and presented to Board

Appendix D – Early Childhood and Primary Development Group for mathematics

Membership on the Early Childhood and Primary Development Group for mathematics

Chair	Dr. Elizabeth Dunphy
IFUT	Dr. Jacqueline Fallon (until August 2017)
	Dr. Lorraine Harbison (From September 2017)
DES Inspectorate	Dr. Catherine King
Foras na Gaeilge	Ms. Grace Dollard
CPSMA	Ms. Suzanne Cobb
NAMSBE	Ms. Mary Davidson
INTO	Ms. Maeve McCafferty
	Ms. Dolores Killian
	Mr. Pat Collins
	Ms. Siobhan Lynskey
Co-opt members	Ms. Mary Irving
	Ms. Catherine O Connor

Dates for ECPMDG meetings

2016	**2017**	**2018**
29th September	9th February	5th February
20th October	23rd March	30th May
1st December	27th April	
	18th May	
	6th September	
	7th December	

Appendix E - Written Submissions

Written submissions were authored by the following persons / organisations:

- Irish National Teachers Organisation (INTO)
- An Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta (COGG)
- National Council for Special Education (NCSE)
- Staff of St. Paul's N.S. in Ratoath, Co. Meath.

Appendix F – School Network schools

Creeslough N.S. Creeslough, Donegal

Scoil Íosagáin, Buncrana, Co. Donegal

Rochestown Educate Together N.S., Rochestown, Co. Cork

Lisheen NS, Lisheen, Co. Cork

Gardiner Street School, Dublin 1

Scoil Ide, Corbally, Limerick

St Hilda's Special School, Athlone, Co. Westmeath

Gaelscoil na Déise, Waterford

Scoil Sailearna, Connemara, Co. Galway

Appendix G - Summary of Data

Code	Title	Origin	Description
Q1	Online questionnaire	Online questionnaire	1,104 responses from the online questionnaire as collected from November 2017 – March 2018
C1	Consultative seminar	Three consultative seminars	90 feedback forms as received from participants attending the public consultative seminars
S1	School 1	School Visit	Field Notes x 2
S2	School 2	School Visit	Field Notes x 2
S3	School 3	School Visit	Field Notes x 2
S4	School 4	School Visit	Field Notes x 2
S5	School 5	School Visit	Field Notes x 2
S6	School 6	School Visit	Field Notes x 2
S7	School 7	School Visit	Field Notes x 2
S8	School 8	School Visit	Field Notes x 2
S9	School 9	School Visit	Field Notes x 2
I1	School context	Introductory meeting	Schools individually reflected on current context – identifying positives / challenges / advantages a new curriculum could bring / barriers it could face
I2	Expectations	Introductory meeting	Expectations / questions about working in the school network
I3	Strands	Introductory meeting	Strands as covered by each school
M1	WWW/EBI	Midpoint meeting	Participants identified what was working well and parts that could be improved
M2	Support materials	Midpoint meeting	Participants identified curricular / non-curricular supports
M3	Improvements	Midpoint meeting	Pyramid activity to suggest improvements for the specification
E4	School network questionnaire	Endpoint meeting	Final questionnaire to teachers / principals
E5	Planning	Endpoint meeting	Discussion following examination of planning templates

E6	Progression Continua	Endpoint meeting	Discussion on three key questions regarding Progression Continua
E7	Walking debate	Endpoint meeting	Responses of participants during the walking debate
E8	Support material – specific	Endpoint meeting	Ten examples of support material for 'Place Value'
E9	Circle reflection	Endpoint meeting	Participants reflected and compared where they were in the beginning and end of consultation process
T1	Questions and comments	PDST Meeting	Questions and comments from participants
T2	Opportunities and challenges	PDST Meeting	Groups noted potential opportunities / challenges for new PMC
T3	Recommendations / suggestions	PDST Meeting	Turned challenges into recommendations / suggestions
T4	Support materials	PDST Meeting	Identifying supports that will help teachers implement the new PMC
T5	Implementation	PDST Meeting	System readiness for implementation
P1	Support material	NPC Meeting	Six ideas for support material
P2	Three questions	NPC Meeting	1.How children like to learn maths? 2.How can curriculum help parents to support children's learning? 3. Key messages that curriculum should have regarding parents?
P3	Questions and comments	NPC Meeting	Questions and comments from participants
W1	Written submission	NCSE	Written submission received October 2017
W2	Written submission	COGG	Written submission received February 2018
W3	Written submission	INTO	Written submission received March 2018
W4	Written submission	Ratoath NS	Written submission received March 2018