

An Ontario Study on Parental Involvement in Student's Mathematics Education: An Improvement-Oriented Evaluation Approach

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In this paper, I describe an evaluative project which utilized qualitative multiple case study approach to identify factors that influenced distribution, use, and utility of a resource intended to engage parents in their children's K-8 mathematics education. In Ontario, the government initiated programs to engage parents through resources available in multiple languages at the Ministry of Education web site. Also, the school boards are asked to work with Parent Councils, at both the board and the school level. One of the resources for parents to use at home with their K-8 children was packaged as printed materials and distributed to elementary schools in Ontario. Although the development of this resource for parents was informed by research and positively received by teachers (Colgan & Patrician, 2016), anecdotal reports from the field indicated that it was used differently, so this study was initiated to capture such approaches, identify challenges in access and use, and provide some recommendations to educators and for the government.

LITERATURE REVIEW

The review conducted for this study highlights the importance of understanding schooling as a formal part of children's education, which is otherwise largely informally done at home (Hornby & Lafaele, 2011). It also identifies some common factors for successful parental engagement in children's schooling, as well as identifies models of school collaboration with parents.

In view of the new reforms changing the curriculum and how mathematics is taught in Ontario schools, it is important that parents understand what has changed, why, and how. This was a crux of Onslow's (1993) implementation of a *Family Math* program. This program was initiated in the United States and then applied in several other countries, including Ontario. It was envisioned as an opportunity for parents to work with their children while they are doing mathematics. The program helped to promote positive attitudes towards mathematics in both parents and their children, and parents' understanding of current methods of teaching mathematics, such as importance of manipulatives. However, Onslow cautioned that since a very few parents of disadvantaged children attended, the Family Math program may be widening, rather than reducing the gaps between the students and families in need and those that are

traditionally more involved and successful. Similarly, Davis (2000) suggests that it is necessary to find ways to reach all families, not just to those who attend meetings at school, as well as to acknowledge their cultures. Davis suggests different strategies for parental involvements with schooling, of which the most relevant is the list of suggestions to enhance learning at home.

Differences were found in how parents from different cultures tend to evaluate their children's mathematics skills (Pezdek, Berry, & Renno, 2002); Asian parents are too critical and American parents are too uncritical. If parents are unaware of "the frequency or severity of children's problems [it] reduces their effectiveness as a source of help to their children" (p. 771).

Jackson and Remillard (2005) confront the literature which presents parents as "the stumbling blocks for reform" and instead consider parents as "intellectual resources" for their children. They also see the bias in explaining "low levels of involvement among low-income parents from the vantage point of the school" (p. 54). The way to include parents in "the educational conversation and treating them as partners" is to create opportunities for them "to develop knowledge and strategies that are aligned with the curricular approach used in the school" (p. 71).

In case of teenagers, holding a high parent expectation of educational performance was the strongest predictor of mathematics performance (Yan & Lin, 2005). In the meta-analysis of 14 studies Patall, Cooper, and Robinson (2008) found the strongest relationship with achievement in cases when parents have established homework rules (e.g., when and where to do homework). Hill and Tyson's (2009) meta-analysis of 50 studies found the strongest correlation between achievement and academic socialization, which is parents explaining purposes, goals, and meanings of academic performance, linking knowledge presented in school to child's interests and contemporary events, discussing learning strategies, and helping students to develop and achieve aspirations. Hill and Tyson hypothesize that parents' help with homework may be more prevalent with students who struggle, which may partially explain some negative reported correlations with mathematics performance.

PROJECT SCOPE

The study was framed by an improvement-oriented evaluation model (Patton, 2002), a method known to be efficacious in gathering data about many stakeholders' views, expectations, and impacts of a particular initiative. Initially, the plan was to obtain a purposeful sample of 12 cases in Ontario, which would be then explored in depth (Patton, 2002). The researcher used the leads

obtained from the resource development team to create a core sample for this study. Through the snowballing effect, other leads were followed too. This approach enabled the researcher to identify and select individuals and groups that would be particularly knowledgeable about the resources for parents and would be able to inform this research about a phenomenon of interest (Cresswell & Plano Clark, 2011)—namely, which strategies proved to be effective in mobilizing a resource for parents.

While minimizing bias in selection of cases was not the primary concern in this project, after creating profiles of the school cases, the researcher sought to “understand retroactively how the properties of the selected cases comport with the rest of the population” (Seawright & Gerring, 2008, p. 295). This step has helped with interpretation of the results. Also, any evaluation study is based on the comparison between what was envisioned by the developers and “the situation found at follow up” (Weiss, 1998, p. 275). Since the Ontario government next planned the release of resources for parents of secondary school students, it was important that it does not repeat observed deficiencies, if any, of the previous release.

METHODOLOGY

The project utilized qualitative research methodology, treating each school board/school as a case. The challenge was to identify representative cases (Seawright & Gerring, 2008), since implementation of the resource was at different stages and feedback from schools was just emerging and sporadic. In any case, the researcher intended to collect the range of examples of how the resources for parents were set in motion.

The following research questions were guiding this project:

RQ1: *Why did the groups of stakeholders decide to use the resource / to lead the implementation of the resource?*

RQ2: *How did the groups of stakeholders determine what are perceived strengths, benefits and challenges of implementing the resource?*

RQ3: *Do the groups of stakeholders see the transformative potential associated with use of the resource? How?*

Data for this study were collected through the audio-recorded interviews and triangulated with online documents and artifacts. The documents that relate to use of the resource were found on the Ontario school boards'/schools' websites. The background work for this project was immense and in many ways more informative than the data collected through interviews. The

main difficulty in conducting this study was in finding informed participants, as majority of the contacted interview candidates did not know about the resource or did not feel knowledgeable enough to talk about its implementation. Overall, 20 Principals, teachers, school board consultants, and parents were either interviewed or communicated with through email.

FINDINGS

Why did the groups of stakeholders decide to use the resource/ to lead the implementation of the resource?

The experiences differed across the school boards, within each board, and across the schools.

The most frequent answer was that the board staff have heard about it, however, those who claimed that they knew about the resource, would rarely know if anybody in the school board used it. The messaging was definitely not there, as multiple respondents confirmed. One

Principal wrote:

I haven't tried using the resource with parents, I am not sure how many Principals use it in the board. We did not get much info-it was just uploaded on the board website under Parents' section. Highlighting its value was missing. How administrators see using it? How many Principals looked at it? ...It was also available in a hard copy—4 per school. I am not sure what you are going to do with only [that many]? It needs to be shared with parents during an event. ... How to get something useful for administrators? It is in modules. A tool is very detailed and [during events] we have at most 1.5hours with parents, so what should we do—introduce Module 1 [first]? Giving the parents the link to materials?

The scale at which the resource was introduced varied significantly. Four Principals confirmed that in their schools the resource was introduced during the Parent Night/Family Math Evenings with respectively around 20, 30, 33 and 150 and families. One public school board organized a whole-day event for almost 400 parents and children, where in one session, the resource was introduced as having “modules with simple, but effective methods and materials for parents” and useful activities for “a math night” (documentation on the board's web site).

It appears that there were two ways in which the resource was used: (a) in the sessions with Principals and the Parent Council, and (b) with parents, during Family Math Evenings.

These occasions were described in the interviews and sometime found place on the school's/school board's websites:

In our district, the kits were sent to all schools last year. Messaging was given to principals about the resource, [highlighting] the growth mindset: “we are all learners,” and how to use them. The principals were then asked to share the resource with parents at their parent council meetings. While some just spoke to the resource, [about 1/3 of our

schools] invited me in to run through some of the modules within the package--it really depends on the administrator and the parent community. Our parent engagement committee has had me speak to them twice about the resource. Overall about 120 parents heard about it (out of 1,000). We also used social media—the board website, Twitter, Facebook, so we probably have reached to another 100 of parents.

(School Board Consultant)

One parent, Maria, described her experience with a resource. As a member of a school's Parent Council, Maria attended the Math Night with her two daughters who are in Grade 6. One of the parents who is also a staff member, suggested that they organize a Math Night/Games Night. Rationale was that girls do well by grade 7 and then boys take over. The staff member/parent wanted to make mathematics fun for parents and children, and used the resource. Parents could come with children and spend two hours visiting different stations with games. Children could play different games developed through the resource. In the end, there were some awards and families could take home the games they were awarded with. Families from the sister school were also invited. Since that school is really small, the two schools often share resources and organize joint events. All families received gift bags with helpful hints, ideas, marbles, dice, and deck of cards.

Although Maria did not use the resource at home ("I do not have time"), she liked its use during the Math Night, as the resources were tactile and different stations made learning fun: "Other parents felt the same and we asked children what do they think-they were all very excited." When asked what does she like best about the resource, Maria said: "Parent can do it with the kid, it was free, and kids could do it with their peers. It was introduced during a social evening."

How did the groups of stakeholders determine what are perceived strengths, benefits and challenges of implementing the resource?

The stakeholders in this study included, the school boards' staff (Consultants, Coordinators, Managers, Supervisors, Facilitators), school administrators (e.g., Principals), teachers, and parents. Those who knew about the resource and used it, thought that it is a very good resource. A Consultant from a school board in which the researcher found that the resource was used in some schools counterbalanced this finding by stating that, "there is confusion if [elementary resource] materials got sent to the schools or to the board for distribution. [People that I talked to] do recall getting an email possibly about the resource." One would expect that the consultants

would be among educators who would know what mathematics resources were sent to schools and what was their intended purpose. It was notable throughout the study that content specialists seem to not have in their portfolio enhancing teachers' skills in working with parents.

Praises were heard from the Principals of schools in which the resource was used in some way. They emphasized that it is “user-friendly” and how “it is easy to pull pieces out of it.”

For parents, the problem is that they need to “set aside the time, [while convincing] kids [who] resist to do school activities outside the school.” Also, “it may prevent parents to use [the resource] if it is difficult to understand.”

According to one teacher, “parents are worried that they cannot help children with math—follow what is being done in classroom.” However, this may not be the problem, since the resource “presents math in enjoyable and practical way. Parent may see that “I can do it as hands-on.” At the same time, depending on a locale, it is difficult to engage parents:

My school is small and parents are mostly low [socio-economic status]. There is small interest in school. [Developers need to make] sure that [the resource] is parent language-friendly. [The resource] has case studies and videos. Brochures, fact sheets are for parents—there are lots of words on a page. Parents may struggle with brochures—videos would be more useful for such parents. (Teacher)

Do the groups of stakeholders see the transformative potential associated with use of the resource? How?

One teacher described her efforts to promote the resource which she considered very valuable for learning mathematics. She explained that, “the booklet with all the math games is exactly what we needed!! We are going to use parts of it to send home in our bags and to have a table with calculator tricks, card tricks, number tricks,.. all from that [booklet]!” She was very enthusiastic about the resource and promoted it at different venues:

I just presented a kindergarten math workshop for the school board and my part of the presentation was about family engagement. I praised and praised the math kits that were sent to the schools and almost no one had heard of them or seen them!! So I am helping spread the word! ... I am trying hard to get people to use them as they are amazing!!!

Another teacher appreciated that, “Implementation guide shows you how to do that in the evening. It opens avenues to engage parents.” Without adequate support, the respondents thought that the potential this resource has will be lost. They advised that teachers need to be trained and clear on what they should be doing with it, in which order they should use the modules, and how.

Challenges of implementation. In some conversations, the researcher heard flat refusals to invite parents “to mess up with children’s learning of math,” as the parents may not have positive attitude towards learning mathematics, the way how mathematics is now taught in schools, or adequate understanding of mathematics and curriculum. The schools may have a biased approach to parents, considering them as disinterested, “intimidated with math,” and “illiterate.” Educators must consider the cultural norms shared by the groups of parents and find the best approach to “get them excited” to engage with schools.

Although the schools utilize Parent Councils, their work “most often turns into a fundraising,” as one teacher described, or because of their tight agendas, the learning resources may be presented at the Council in only 15-20 minutes. Several informants shared a concern that “we are sending the same message to the same group of parents every year” (Mathematics Consultant). Also, “[just] handing [parents] the pamphlet, does not work” (Teacher).

Teachers suggested that Principals need to be more “encouraged to disseminate information” the school receives. Messaging may be stifled by the school administrators (a) trying to protect staff from being bombarded with information that is considered as not aligned with the school focus, or (b) by their oversight: “It is an effective tool that needs to be promoted and schools reminded of it—it gets buried under the stuff, principals move.”

Challenges of access: The website/document analysis. After finding gaps in mobilizing the resource, the researcher also inspected the websites of 18 school boards, looking for mention of the resource, and for boards with open access to their Parent Committee meetings, checked the agendas and minutes from Nov 2015 until start of the 2016-17 school year. Here is a summary of related findings:

- Seven (7/18) boards did not have links to academic resources on their websites (e.g., the term “non-academic” refers to resources on mental health, bullying and online behaviour).
- Five (5/18) boards had links to some ‘helpful resources for parents’, but they did not contain direct link to the resource.
- Five (5/18) boards’ websites contained direct mention of the resource and a direct link. However, these details were found in very different documents and places, such as in the minutes of the Parent Involvement Committee and a bi-lingual Parent Engagement

Resource list; under the Parent Resources/Math Homework Help/Additional Resources/; or in a board's newsletter.

The websites were re-checked in October 2017. On the websites of four boards, where the information could not be found earlier, there was a link to the resource. However, it seems that there was no improvement in easiness of access, number of links that one had to use to get to the resource, as well as the variety of terms used to describe the content of the link (e.g., supporting your child in mathematics; parent guide numeracy; math support; parents resource; parent resources; numeracy, etc.). Also, some boards used the document titled "Parent Engagement Resources," containing a list of 28 links (resources). With links in English and French (i.e., 56 links) and no organization of resources, the parents would have to be very determined and knowledgeable to find the resources useful for them.

DISCUSSION AND CONCLUSIONS

While this study has confirmed many known barriers to parent engagement with schools, it sought to specifically identify those that school boards and schools have control over or that could be alleviated through joint effort with families (Carter, 2003). The common practice of passing the information to the Parent Council or posting it under the links for parents on the organizational website, proved to be inefficient without further, concentrated, effort of the school board/school staff.

Using selected activities from the resource during Math/Family Nights was a predominant approach in utilizing this resource. This researcher did not find evidence that families embedded it into their regular home activities. The only two informants who used it at home with their children, were educators themselves, which may point to the home-school gap that still exists in Ontario. On one hand, parents may think that teachers do a better job at teaching their children and that children may not want them to help (Brock & Edmunds, 2010); although some schools reported sending to parents some practical ideas and resources from the resource to work with their children at home, this study did not find evidence that these were utilized. Following Green, Walker, Hoover-Dempsey, and Sandler (2007), teachers should involve students in inviting parents to do activities sent home, as invitation from the child is proved to be the most significant motivational factor for parents' engagement.

On the other hand, teachers may perceive parents as unfit or disinterested to help with children's schooling. Although some teachers in this study mentioned low SES as a factor for parents not being involved, Anderson and Minke (2007) emphasize that teacher-specific invitations were the largest predictor of parental involvement, while efficacy and distribution of resources (e.g., time, transportation, and child care), had little impact on whether parents became involved. It seems that educators need to keep trying to open opportunities for parents and children to learn together and not give up prematurely.

The literature recommends that schools get to know their community. One educator in this study talked about a language barrier when resources for parents appear only in English and French¹. Kim (2009) suggests that creation of family centers in schools would enhance the family-school-community relationships in multicultural regions, such as ours. Zhong's (2011) study cited Chinese parents saying that "[teachers] didn't expect parents to do anything to help children's learning" (p. 109). Educators can only benefit from learning more about cultural norms and expectations that parents have. While this may increase cost of development, consideration should be given to communicating with parents in other languages, such as Chinese, Arabic, or Spanish. Parents who are multilingual could be invited to help schools communicate and reach out to parents who cannot fluently follow communication in English or French.

This study also confirmed importance of parents understanding what has changed in curriculum and how mathematics is taught in Ontario schools (Onslow, 1993). Educators in this study found the transformational potential of the resource in providing the hands-on approach that would help parents understand "why" their children are learning mathematics the way they do. Videos that accompany the resource, provide explanations and useful hints that go beyond the "that is how it is done" style. However, Onslow's warning, that the outreach programs may widen the gap between the students and families in need and those that are traditionally more involved and successful, remains relevant. Educators in this study pointed to the problem with "sending the same message to the same group of parents every year." The scope of the problem becomes clearer through the observation of one of the project informants that the resource was introduced face-to-face to "about 120 parents ...(out of 1,000)," in addition to parents reached

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through social media—the Board website, Twitter, and Facebook (in her estimate, another 100 parents). Compared to examples from other boards, this outreach program was successful, however, if the next Math Night was attended and the social media accessed by the same parents, it may be that about 75% of parents remained uninvolved.

The literature review prepared for this project presents different methods of parental engagement and schools should continue to comprehensively and aggressively get parents on board. As Sheldon and Epstein (2005) advised, schools need to move beyond basics in developing partnerships with parents. Utilizing Parent Councils as fundraising sources presents a limited view of what the parents can contribute to schools, and deters most parents, especially those with inadequate means. Such an approach will continue to fuel the notion that “parent engagement is socially determined” (Yan & Lin, 2005). If schools espouse the view that parents are “intellectual resources” for their children (Jackson & Remillard, 2005) who even, when unable to help children with academic content, can help with academic socialization (Hill & Tyson, 2009), then Parent Councils’ main role is to convey such a message and to ensure that most of their activities relate to educational conversations between and with parents.

Given the limitations of this study, it can be concluded that the resource was well accepted by different stakeholders. The contacts with 18 school boards in Ontario and many more informants within each of the boards, ensure that even those who at first did not pay attention to the resource, had it on their radar after talking to the researcher. During the scope of this study, number of the school boards, whose websites contained the links to the resource has doubled.

Reflecting on strategies of educational research. This paper presents encounters in conducting an improvement-oriented evaluation study (Patton, 2002). It demonstrates the challenge for the researchers when the outcome of the program appears not to be reached. In such cases, the researchers need to do more work and to conduct further inquiries (Weiss, 1998). In this study, the original plan was to interview users of the resource in 12 school boards, which proved to be, at that time, not possible. Simply put, using the snowballing strategy for finding participants, did not produce enough cases or enough variety among the cases. It seemed that the resource was mostly used during the parent nights and that in its entirety did not reach the parents, instead, they and their children left these events with a sample of activities. The researcher then used her judgement to look into the school board websites across Ontario. She

found deficiencies in how parents were informed and was able to make suggestions to the Ministry regarding instructing school boards to align and simplify messaging to parents. As an evaluator, the researcher thus found strengths and weaknesses in the program for engagement of parents in their children's K-8 mathematics education. In order to make sensible and practical recommendations, she had to extrapolate beyond the data (Weiss, 1998). Answers to the research questions and the accompanying recommendations likely resulted in changes and overall improvements of the programs for engagement of parents in mathematics education of their children.

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