What Catches On?
The Role of Evidence in the Promotion and Evaluation of Educational Innovations

By

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A Thesis Submitted in Conformity with the requirements for the degree of Doctor of Philosophy, Graduate Department of Leadership, Higher and Adult Education Ontario Institute for Studies in Education, in the University of Toronto

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Abstract

The debate about and support for innovation in education has heated up. There is hype around the possibilities novel and disruptive innovations can have on changing education practice and providing more effective learning solutions. The advent of the Internet and social media technologies allows for an abundance of innovation to be promoted and shared with and between educators, and the increasing use of technologies like iPads in the classroom results in the advertisement of innumerable new education applications. For the educator, there is the difficult challenge of knowing how to sift through this material and separate those innovations that may hold value for their classroom situation from those that have gained wide appeal.

In this thesis I take an interest in how certain education innovations catch on and are adopted on a large scale, and how the marketing of these innovations in various kinds of media as well as the ways they are evaluated by teachers, contribute to this process. I separate my findings into two articles and use a set of six qualities generated from the research use and social psychology literatures as a guide (evidence, compatibility, accessibility, practicality, credibility, appeal), focusing on evidence in relation to the other five qualities. In the article on media promotion, I find the kinds of evidence used rarely came from formal research studies, but from anecdotal forms of evidence and general statistics related to use of the innovation. In the article on teacher evaluation, I find the teachers were open to trying out innovations, but had different strategies for evaluating and selecting them. Evidence was often discussed as a low priority
criterion on which to base judgments. Overall, the results of this thesis show how difficult it can be to make a quick and informed judgment about these innovations where the teachers lacked tools to evaluate them consistently and effectively and where a wide range of strategies were used in their promotion. This suggests an important need that is largely not addressed in teacher training programs and professional development around providing teachers with guidance and training in their search, selection and evaluation processes.
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Introduction

“To date, no one—not the school choice community, not foundations and certainly not colleges of education or professional educators—has devoted much attention to the machinery that can help bring promising ideas to the surface and maximize the chance that innovators will have an opportunity to make a difference.”
Frederick Hess, in the *Future of Educational Entrepreneurship* (Hess, 2006)

“One of the most important reasons for the continuing existence of the educational pendulum is that educators rarely wait for or demand hard evidence before adopting new practices at a wide scale.”
Robert E. Slavin, in *The PET and the Pendulum* (Slavin, 1989, p. 753)

The debate about and support for innovation in education has heated up. Professional organizations promote various innovations, education incubators are being set up to bring new ideas to the market, peer reviewed publications use innovation in their title names (e.g. Journal of Educational Research and Innovation), and major education associations such as the American Educational Research Association have themed their conference around innovation for improvement of practice. While the education industry is soaked in the language of innovation, sorting out the meaning of innovation and its dilemmas is complex. Many innovations don’t last; innovations are sometimes adopted without much supporting evidence; ideas with good evidence do not get adopted; or innovations get adopted but in a form that is different than intended or in such a diluted version that their impact is lost. Measuring the effects of the innovation may be quite difficult as well. Indeed, the very meaning of ‘innovation’ is obscure; there are many ideas around identifying what constitutes an innovation itself. As the two quotes above reveal, there is a tension between creating the supports necessary to encourage innovation while also preventing the widespread adoption of practices not based on research evidence.

One might consider innovation as a process of making change, both radical and incremental, and as a particular idea, practice or thing perceived to be new by those who are considering its adoption. In this thesis, I take an interest in how certain education innovations catch on and are adopted on a large scale, and how the marketing of these innovations in various kinds of media as well as the ways they are evaluated by teachers, contribute to this process.

In this introduction I will provide some background for the two studies that follow in this thesis (presented as stand alone publishable articles). I first discuss why I focus on evidence and its
role in the promotion and evaluation of the innovations. I then explore the various meanings of innovation and outline the set of innovations I examine in my two studies; next I review relevant literature on the spread and adoption of innovations, and on research use and the social psychology of persuasion, leading to the framework I use in my research. I conclude by providing a brief overview of the two studies I conducted.

**Focusing on The Role of Evidence**

In this thesis I emphasize the role of research evidence in relation to the innovations I study, examining how teachers evaluate them and how they are promoted in the media, and therefore ultimately how they may catch on. Although there are many forms of knowledge one might consider to be important (e.g. professional experiences, personal beliefs, etc.) and although research at times is contradictory, incomplete or incorrect and has the potential to be erroneously used to back up one’s views, I take the widely advocated position that research evidence can and should play an important role in the crafting of policies and in the assessment of what kinds of practices, approaches or ideas are best for what circumstances (and in this case, in guiding decisions about which innovations to use). The potential benefits associated with using research are intuitive and understood; for instance, research studies that are built over time in an area have the potential to guide us towards practices that are better or improved and away from those that are ineffective; research can be used to justify why actions are taken or to argue against those actions that may be costly and unproductive; and research also has the potential to stand against decisions that may be politically motivated or self-interested. The transfer of research, however, is an indirect and complex process, with many complications; there is debate about what constitutes knowledge, how it can be used to inform practice and in what its potential for impact might be. Despite these problems, the importance of research evidence as a tool to inform policy and practice is reflected in the growing and cross-disciplinary, cross-sector and cross-country area of work concerned with strengthening connections between research, policy and practice known in various cases as knowledge mobilization, knowledge transfer, knowledge exchange, research utilization, etc. A few main areas of work have examined research using contexts, such as the interpretation and use of research by practitioners (Biddle & Saha, 2002; Zeuli, 1994); research producing contexts such as in how to better disseminate research findings (Huberman, 1990; Rogers, 1962); the impact of research on practice (Mortimore, 2000; Nelson, Leffler & Hanson, 2009); and the role of ‘intermediary’ organizations that support linkages between
producers and users (Honig, 2004). Prominent organizations such as the William T. Grant Foundation in the United States and the OECD have taken a special interest in exploring and developing this area of work as well. In addition, the past several interviews with leading education change scholars in the 2014 AERA Lead the Change series has focused on the theme of “promising educational change innovations” and the role of research in relation to them; the leaders expressed various thoughts ranging from concerns about a ‘best practices movement,’ to a push to conceptually clarify innovation’s meaning, to reflections on how best to ‘transplant practices’ across contexts and the role of ‘systematic experimentation’ in the process. Other organizations such as the Education Endowment Foundation and the University of York in the UK are focusing on evaluating innovations and working to share or scale up those practices that work best or have greatest potential for positive impact at a large scale. Building on this work, I choose to focus on exploring the role of evidence in the promotion and evaluation of the innovations selected in this study.

From a young age I developed a strong belief in innovation as a positive way to create change. Feeling dissatisfied with my learning, I transferred high schools and attended public alternative and for-profit schools accumulating enough credits to be able to graduate early. This strategy gave me more freedom to pursue learning in a way I felt it ought to be designed and also gave me a strong belief in decentralized reform and the possibilities of those innovations and options that exist outside a system. In college and graduate school I turned to several start up programs to explore this belief in innovation as a source of change including Stanford’s Summer Institute for Entrepreneurship, where I worked with a team of students to design a digital science animation company, and the Goldman Sachs Global Leaders program, where students are provided funding and supports to develop social enterprise organizations, and as an applicant to Kauffman Education Ventures, a start-up program. My doctoral experiences working with a group of students on research that explored connections between research, policy and practice encouraged me to take a different approach, however, and to question the value of innovation and its relationship to what is considered to be new and effective. My original beliefs on the intrinsic value of innovation were challenged as I began to consider the abundance of things, ideas, approaches and practices promoted as innovative and to question innovation’s potential impact (for instance, whether the innovation can be scaled and positively impact large numbers of students in a system). While the entrepreneurship programs I was involved with stressed finding novel
solutions, I wanted to think more about how these kinds of solutions related to evidence and the extent to which evidence could be used to support claims made about or in the development of the innovation idea itself. My thesis developed from this desire to better understand innovations and their relation to evidence, focusing in this case on how evidence is used in the promotion of the innovations and in their evaluation and subsequent take up. Below I further explore this relationship between innovation and research evidence, and relate this to the ideas within the two articles included in this thesis.

**Innovation and Evidence**

An interesting philosophical exercise might be to think about how one would imagine how to design a school or school system. If the current ways of practices, the structures and institutions through which they take place, the people, environment and processes disappeared, how would one choose to build the education system? Would one include a system of grading and accountability? A standardized curriculum? What class size would be chosen? What subjects would be taught? How would one design the physical space and building? How would teachers be trained? Who would be the provider? What role would the community play? How much would it cost?

These questions are complicated, boundless and difficult to answer, with infinite possibilities. Even if we were given an opportunity to redesign a school or school system as we see it in our own mind, it is likely we would fall back on what we know or have done in the past, the same way that systems fall into habitual routines and cultures that are challenging to press out of their equilibrium state. It is just all too easy to answer these questions based on personal experiences and preferences.

The power in innovation may lie in the ability to re-imagine, dream and re-create. However, in their pursuit of creation, innovators often lose sight of guides for their design, relying on their own experiences, ideas of the time, and political and public opinion. The final creation may or may not draw from evidence of effective practice. However, cultivating a base of intellectual capital and compiling what is known, or guiding their creations on research evidence, is critical to the prevention of experimental repeats and failures (e.g. Broekkamp & Hout-Wolters, 2007; Vanderlinde & van Braak, 2010). One way to begin to imagine creating a system from scratch while protecting from habits, personal beliefs and larger societal views would be to examine the research evidence behind those fundamental blocks that make up the base of the
system, including building design, parental involvement, school time, curricula forms, class size and other elements.

In their recent book *Creative Confidence* (2013), Kelley & Kelley, founders of the popular Stanford d.school, a centre that encourages design and creative thinking, describe a process for generating ideas in the innovation process. These include a deeper understanding of *human factors*, getting to know people and the way that interact with things, a compassion for their needs; a mind that is open to experimentation, finding inspiration through exposure to new environments and experiences; a generation of many ideas, releasing the fear of failure with an openness to exploration; and then synthesizing what has been learned by identifying themes and patterns across what has been observed and learned about people and the ideas that have been generated. Experimentation is a key step in their process, which “can include everything from crafting hundreds of physical models for delivering transdermal vaccines to using driving simulators for testing new vehicle systems to acting out the check-in experience at a hotel lobby (p. 24).” One exercise they give to students in their program is to “redesign the experience of getting your morning coffee” (p. 28) where from a simple problem all kinds of solutions and ideas can be developed, as they describe for instance, an automatic stirrer in the cup to a coffee-pot that can heat the coffee to the person’s temperature preference.

The d. school brings together students from all disciplines across the university. Creative and design thinking, as a way to re-imagine and experiment, can be powerful. In education, it could be re-imagining a better communication system between teachers and parents, a way to modify or restructure a curriculum, a reorganization of the physical surrounding. Applying creative persistence in a deeper understanding of problems and finding of novel solutions has value.

However, when experimentation becomes the norm in a field of practice, a number of concerns arise. First, what is tried, the idea or spark of innovation, may not be grounded in what is known about what works from the research literature, or what has already been explored. While the d.school emphasizes learning about human needs and conducting one’s own investigation about how their ideas work with participation, the approach does not emphasize a systematic examination of how similar ideas have been tried or searching for the research supporting these ideas. This is important in education because teachers, schools and districts may be repeatedly experimenting with overlapping ideas and not learning from one another’s failures.
or successes. Given the abundance of innovation that is promoted as new and innovative, experimentation may only be part of the answer. Experimentation should be coupled with a more careful approach of identifying core needs and drawing from the research literature on how those needs have been addressed more effectively, intentionally selecting innovations that hold promise and that are consistent with what is known, and thinking through the scale up potential of these innovations.

Indeed, for the innovation to have a significant impact, it would also need to be scaled up, or expanded to multiple settings and used by many other teachers, schools and districts. Scaling up innovations, however, is a complex and challenging endeavor, requiring multiple considerations such as resources, student backgrounds, practical circumstances, teachers’ ideologies, political ideologies (parent, teacher, community engagement/support), cultural elements, legal and bureaucratic regulations, and competing priorities (Elmore, 1996; Sanders, 2012). Also, would it be an exact replication or mutated form? With constraints such as turnover in staffing, competing demands, and resources, would it be sustainable? Often reforms are enacted in a different way than is intended, with unanticipated outcomes (Datnow, 2002) and at a superficial level rather than creating deeper changes in practice (Coburn, 2003). Therefore, while an innovation in education may sound appealing as an idea, its potential for change is moderated by many other factors. Without achieving scale and a consideration of the many complicated factors in this process, an idea, no matter how appealing or thoughtful, will likely not have the larger impact desired.

In addition, the process of trying out and implementing innovations can be costly. It is common knowledge that the failure rate for start-ups and venture capital investments is high. From a study examining 2000 companies between 2004 and 2010, as cited in the Wall Street Journal, about three of four venture-backed firms in the US did not provide a return on investors’ capital (Gage, 2012). In education, there is a lot of belief in the ability of technology to transform learning practice, seeing a huge investment interest (Davis, 2012). However, technology requires costs—network set up, teacher and student training, trouble shooting, etc that may supersede its potential benefits. One such example includes laptops for all in education. While some studies, reporting on anecdotal evidence, suggest laptops may encourage collaborative work, other studies emphasize that achievement will not be impacted unless teaching practice changes (e.g. Barrera-Osorio & Linden, 2009; Penuel, 2006). If not considered
carefully, the potential costs, to purchase the innovation and in its implementation and monitoring, the opportunity cost associated with investing one’s time in that innovation, the time it would take to mediate political challenges, etc., can be enormous- and it would be particularly troubling if the innovation is not consistent with what is known in the related research literature on effective practice or even more-so if the innovation has already been tried in several forms in different times and places.

Therefore, an innovation will not necessarily have the kind of impact its creators anticipate or hope for. Many widely advocated education innovations have lost steam (whole language, abstinence only sex-education, differentiated staffing, etc.) and proposals for change are often adopted and soon abandoned (Ravitch, 2001), a wasteful process, especially when what is learned through the process of experimentation is not shared. Some of these reforms (differentiated staffing) die down because of politics; for instance there was little buy in from states and districts for differentiated staffing due to funding issues and confusion (Meeks, 2011), while others languish perhaps because of growing evidence of their ineffectiveness (abstinence only sex-education) as well as for political and cultural reasons. Without being aware of these issues and learning from others’ trials, the costs of experimenting blindly can be high with low return.

Several scholars have called attention to this central role and importance of evidence in relation to innovation and reform. Maddux & Cummings (2004) describe how innovations eventually fade out in part because teachers and policy-makers tend to ignore educational research (Maddux & Cummings, 2004). They believe this occurs because education as a profession lacks an organized and efficient mechanism to translate research findings into practice, as can be found in other fields (OECD, 2007). Maddux refers to the repetitious and cyclical cycle of fads as the ‘pendulum syndrome’ where the “phenomena begins with unrealistically optimistic claims and expectations for each emerging educational innovation followed by too-hasty, wide adoption in schools (Maddux & Cummings, 2004, p. 512);” the pendulum problem is in part due to this weak role of research in education, where educators may lack the expertise, time and inclination to access it (Firestone & Gonzalez, 2007; Fleming, 1988; Invaer, Vist, Trommald, Oxman, 2002).

Scholar Robert Slavin (1989), in his paper on faddism in education in Phi Delta Kappan also points to the issue of the pendulum and how it might be stopped. “One major factor inhibiting systematic progress in education is the lack of agreement about what constitutes
progress and what constitutes adequate evidence to support action (p. 753).” As Slavin explains, while other fields may have clear indicators of progress (he cites FDA drug approval as an example), several innovations are difficult to evaluate, conclusive evidence difficult to come by. Education historian Diane Ravitch, in her article on ‘Recycling Reforms’ in Education Next, describes a story of her favorite educator William Chandler Bagley of Teachers College, entering the field of educational psychology with the desire for a ‘genuine science of education’ only to conclude after several years that “education included too many unmeasurable [sic] dimensions to compare it with the biological or physical sciences” (Ravitch, 2004, p. 39). Such thoughts demonstrate the important role of evidence (or lack of) in the cyclical process of educational reform, and the difficulties of using research as a way to counter this process.

One effort to moderate and support innovation while reducing waste is by scaling up those innovations that are considered to be effective, for instance, through the use of independent evaluations, pilot projects, and randomly controlled trials. Such can be seen in the work of the Education Endowment Foundation, a grant-making charity in England (http://educationendowmentfoundation.org.uk/apply-for-funding/) which aims to fund “cost effective and replicable projects” that have potential for scale and larger impact, and accomplishes this assessment in part through recruiting large numbers of schools to participate in randomly controlled trials. This is similar to the approach used by the Institute for Effective Education based at the University of York in the UK that focuses on conducting evaluations of programs and identifying which practices work best (http://www.york.ac.uk/iee/), and then sharing these evidence base practices through partnerships with researchers, policy makers and schools. One of their offerings includes the website Evidence4Impact, a database of education practices systematically rated for their evidence support (http://www.evidence4impact.org.uk/ratings.php).

In this thesis, as outlined above, I am concerned with the importance of research evidence (and the sharing of this research) in determining which innovations teachers, schools and systems use. There is an abundance of innovations in education, many that are available free of charge online and possibly promoted as evidence based. In order to sort through this quantity and identify those innovations of value for their contexts and needs, as well as avoid repetition and waste, I take the view that teachers, other school practitioners, stakeholders, schools and systems, should strive to share what they have learned through their processes of using the innovation.
The two articles in this thesis address two issues that focus on research evidence, its relative importance and how it is used. In the first article I explore the selling and promotion of education innovations through a content analysis of professional, mass and social medias in the form of non peer-reviewed journal articles, mass media outlet publications and online blog posts. I ask, “How are popular education innovations promoted in the media?” And, “How is evidence used in this process?” I explore the theme of research evidence by examining the kinds and quantity of research used in the promotion of the innovations. I guide the content analysis by tracking the frequency of various qualities (listed and described below) and how they are used, by publication type and innovation. In the second article, I investigate how teachers search for, select and evaluate the education innovations as they are represented on websites. I explore the theme of evidence and experimentation by looking at how teachers evaluate various kinds of qualities supporting the innovation. I also look at how they seek out and decide which innovations to use. I ask, “How do teachers evaluate widely promoted innovations?” and “How do teachers search for and select innovations?” In this article I look at how teachers determine the relative importance of research evidence to other qualities in their evaluation that might influence their judgments.

In the next section I explore the conversation around innovation in education and explore the various meanings of innovation, leading into a description of the set of innovations I examine in the two studies.

**The Conversation on Innovation in Education**

In the field of education the debate around innovation and entrepreneurialism has increased, especially around the possibilities that initiative, energy and “creative problem-solving” offer to developing those innovative solutions needed to nudge hampered and inert institutions. The dialogue often uses charged language; entrepreneurs or *enterprisers* (Hess, 2006) are “bold,” “persistent” and “transformative” (Childress, 2010; Sandler, 2010). They are the “disruptive pioneers” that rely on the “supply-side.” The assumption is that entrepreneurs are less restricted by the larger education system and therefore have greater possibility for filling market needs and solving problems than the education system alone. Meanwhile the k-12 industry as a whole is described by some as dynamic with potential for growth (e.g. [http://www.kauffman.org/newsroom/kauffman-labs-unveils-inaugural-class-of-education-ventures-program.aspx](http://www.kauffman.org/newsroom/kauffman-labs-unveils-inaugural-class-of-education-ventures-program.aspx)).
Entrepreneurialism includes a belief in the value of innovation as a reform strategy, in the importance of new products, models and services. A draw to novelty and experimentation goes hand in hand with entrepreneurship and capitalism. The education industry is soaked in the language of innovation and innovativeness. For instance, the terms innovation and entrepreneurship are currently highlighted as a central approach on the websites of many major education philanthropic organizations (e.g. Walton foundation advocating school choice and “entrepreneurs who are creating high quality schools”); professional associations will commonly tout support for an innovative approach of one form or another, or offer various innovations for educators to use (Education Week, a popular education periodical, offers a section on “Industry and Innovation” on its website that tracks the K-12 marketplace and new approaches to schooling while Edutopia, a popular professional education resource offers “Education & Learning Innovations”); several peer reviewed professional journals use the term innovation in their title names (e.g. “Journal of Educational Research and Innovation” 1st volume published in 2012; “Innovations in Education and Teaching International” 1st volume published in 2001); and education incubators and venture capital organizations such as Imagine K12, Kauffman Education Ventures, and New Schools Venture Fund actively promote and draw attention to the approach of bringing new ideas to the market. And as New Schools Venture Fund reports on its blog, union leaders and education technology entrepreneurs have merged together for discussions about innovation. For instance, at the 2012 Democratic National Convention “representatives of a combined 4.7 million teachers union members [were] largely in agreement with technological innovators on the need for systems with the openness and agility to rapidly adopt new models that promote real learning” though with some disagreement around the place of for-profit entrepreneurs in the education industry (Schorr, 2012, para. 6).

An alternative approach has been to support education practitioners in becoming ‘intrapreneurs,’ or entrepreneurs developing innovation ventures while working within the system. While educators may take on the role of developing innovations through the private sector, various programs in education have supported practitioners in the development of innovations through funded professional development initiatives. For example, the Teacher Learning and Leadership Program (TLLP) in Ontario to date has funded 500 teacher-led professional development projects across a range of subject areas (differentiated instruction, technology, literacy, professional learning communities, mental health, aboriginal education, etc),
supporting the sharing of what is learned in the process of innovating through professional development conferences (the *Teacher Learning and Leadership Summit*) and a *Mentoring Moments* website that includes forums, blogs and groups. Through the process of developing their projects, teachers’ reported experiencing other benefits such as improved communication and collaboration, improved self-efficacy, improved knowledge and leadership skills and improved technological skills (Campbell, Lieberman, Yashkina, Carrier, Malik & Sohn, 2014, p. 19).

Enhancing teachers’ professional learning and knowledge through a more disciplined form of professional development is an approach discussed by scholars Hargreaves & Fullan (2012) in their book *Professional Capital*, defined as the “systematic development and integration of three kinds of capital- human, social, and decisional- into the teaching profession (p. xv).” Here, the long-term investment in teachers’ professional development is considered to be critical for sustained improvement in a system.

The education industry is also currently flooded with ideas that are promoted as new and innovative. One way to observe this is by searching the Internet. A simple online search for the terms ‘product,’ ‘research’ and ‘education’ and a particular subject area (e.g. literacy, mathematics, physical education, arts) generates millions of hits for each, hundreds and thousands of which could be innovations that are of potential relevance to educators and that may market themselves or claim to draw from evidence in one form or another (Carrier, Sohn, Shah & Jao, 2014). Several popular education texts chronicling the history of educational reform (e.g. *So Much Reform, So Little Change, Tinkering Towards Utopia*, and *Left Back*) describe how efforts to make change to education systems are frequent and often cyclical, where ceaseless changes have been made to such areas as teacher training, assessment practices, evaluation systems and timetabling. These changes may take the form of faddish kinds of innovations that may be weakly supported by evidence (e.g. see Cuban, 2004; Ravitch, 2004; Sarason, 1990; Slavin, 1999).

Examples of innovations that have gained a lot of popularity include core knowledge, comprehensive schools, whole language instruction, multiple intelligences, distance and blended learning models and larger ideas like school choice, markets, and accountability and testing. Therefore, although the history of education reform has seen ceaseless changes made to systems, the idea of entrepreneurship includes a belief that novel ideas and approaches can better be generated outside, unrestricted by this system, and with greater potential to disrupt it.

But why does the idea of novelty and novel solutions hold so much appeal?
Underlying the dialogue on entrepreneurialism is a set of views and assumptions about how the education system functions and the limitations of system-wide reform agendas. Public education systems are viewed as change-averse and bureaucratic, restricted by many obstacles (e.g. collective bargaining agreements, competing stakeholder interests, resistant institutional cultures, etc see Hess, 2006) preventing the movement of positive change. Regardless the well-intentioned efforts of reformers, it is believed that many system-wide improvement efforts (for instance in curriculum reform, assessment practices and professional development) are unlikely to succeed due to this immovable bureaucracy. The merits of a “one size fits all” approach are questioned over the possibilities of those more nontraditional reforms operating at “the edges of the system (Hess, 2006; Nicholls, 2006; Wei-Skillern, Austin, Leonard & Stevenson, 2007).” By privatizing educational services (Burch, 2009; Solomon, 2002) and creating localized opportunities of choice (Buckley, 2007) the so-called innovations developed can penetrate the larger system through competitive force pressures and the political economy of the market (Bagley, Woods & Glatter, 2005; Ryan & Heise, 2002). The promises of technology and virtual/blended learning models are a widely discussed and promoted area that dominates this “supply-side,” or private, market-based agenda.

Innovation, as a concept may hold a certain binary kind of appeal. If what has been tried in the past has not worked, there must be a new method or practice or device that can work better. The innovation should either work or it doesn’t. The idea of novelty in itself has an inherent appeal as well. When something feels stale, burdensome or difficult, it’s tempting to want to place it all to the side as one recreates or creates space for something different and new. To be innovative also suggests that one is analyzing and re-thinking how one performs, an appealing idea related to self-growth and betterment in whatever practice one is trying to improve.

Belief in innovation is also consistent with belief in the entrepreneurial spirit and capitalist ideals. Though they are rare in comparison to the number of small scale, ineffective or costly efforts, successful and widely used innovations such as Google, Facebook, Twitter and others may increase one’s belief in the ability of new things to create rapid, positive and dramatic change. Quick advancements in technology may lead people to believe that there is continued possibility and potential in their application. The belief in the potential of new technologies can be illustrated in the recent innovations developed by educators as part of start up programs like
imagine K12, in the Winter of 2013, 8 of 9 start-up companies developed and funded by Imagine K12 entrepreneurs are software or technology tools; examples include Plickers, a mobile device tool that allows teachers to scan student generated barcodes to their smartphone devices, receiving quick feedback on student answers to questions; Mommazoo, a company that helps parents of students better connect with each other via their mobile phones; and Padlet, a software program for easily sharing and accessing multimedia and documents online. The thousands of applications that are available through the use of the innovation iPad in the classroom, and more sophisticated, cheap, simplified and efficient technology devices may continue to capture the public's attention about how the new can transform the commonplace. Below, I explore the various meanings of innovation in education and describe the set of innovations I examine in the two studies.

**Exploring the Meaning of Innovation in Education**

What does it mean to be innovative? To experiment with and test new ideas? Share practices and seek to improve oneself? A relentless drive for better performance? Not settling for the norm, the average, the expected, but seeking more? Does it mean to have the capacity to learn from one’s mistakes and from others? Implement a new product precisely as specified?

If innovation were everywhere, what would a meaningful innovation look like? Is it virtually anything that is new? Is it necessarily visible? Would any move towards improved performance constitute an innovation?

Innovation comes from the Latin noun innovatio, and the verb innovare, meaning to introduce something new (Aronson, 2008). More simply, several dictionaries refer to innovation as having two aspects, one as the act of introducing something or taking action, and another as the descriptive of that something that is being introduced as having an element of novelty or newness. For instance, the Merriam-Webster dictionary defines innovation as the “introduction of something new” or “new method, idea, device” (Merriam-Webster Dictionary, n.d.). In relation to business, the Oxford English Dictionary defines innovation as “the action of introducing a new product into the market; a product newly brought to the market” as well as “the alteration of what is established by the introduction of new elements or forms” (Oxford English Dictionary, n.d.).

Along with a common theme of action and novelty, there exist several ways of categorizing and applying the concept of innovation. On their website, the OECD refers to a
useful and simplified guide, the *Oslo Manual* in distinguishing several kinds of innovation, for example, product innovations (“goods or services that are new or significantly improved”), process innovations (“a new or significantly improved delivery method”), marketing innovations (“a new marketing method involving significant changes in product design or packaging”) and organizational innovations (“a new organizational method in business practices, workplace organization, or external relations”) (OECD, n.d.). In the first chapter of their book *Applying Innovation*, O’Sullivan & Dooley categorize innovation as applied to several distinct themes including invention, growth, design, exploitation, change, failure and entrepreneurship (O’Sullivan & Dooley, 2009). Several theories exist to describe the movement of the innovation itself (diffusion, circulation, open source, break-throughs, incremental v. radical, etc) and the idea has been related to the larger concepts of change, newness and advantage, as well as across individual, societal, and organizational levels (Wikipedia online, 2012). Table 1 below provides a range of definitions from several sources:

**Table 1: Definitions of Innovation**

<table>
<thead>
<tr>
<th>Source</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peter Drucker, from realinnovation.com</td>
<td>Innovation is the specific instrument of entrepreneurship… the act that endows resources with a new capacity to create wealth (para. 6)</td>
</tr>
<tr>
<td>European Commission Green Paper, 1999</td>
<td>Innovation is the successful production, assimilation, and exploitation of novelty in the economic and social spheres. (p. 1)</td>
</tr>
<tr>
<td>Zaltman, Duncan &amp; Holbek, 1973</td>
<td>Any idea, practice, or material artifact perceived to be new by the relevant unit of adoption (p. 10)</td>
</tr>
<tr>
<td>Business improvement architects</td>
<td>Innovation is linked to performance and growth through improvements in efficiency, productivity, quality, competitive positioning and market share (para. 2)</td>
</tr>
<tr>
<td>Phills, Deiglmeyer &amp; Miller, 2008 on social innovation</td>
<td>A novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals (p. 36)</td>
</tr>
<tr>
<td>Glatter, Castle, Cooper, Evans &amp; Woods, 2005</td>
<td>A significant change in processes, provision and/or organization intended to help meet educational goals more effectively or to promote new goals. (p. 384)</td>
</tr>
<tr>
<td>Schumpeter, 1942</td>
<td>Creative destruction (p. 83)</td>
</tr>
</tbody>
</table>

Innovation in education is also a term that has been defined, applied, and examined quite differently across studies. In his book outlining several specific educational innovations, Ellis
(2014) classifies and defines innovations as practices, ideas or tasks, ones that are often ‘novel,’ ‘unusual’ or at the ‘cutting-edge’. Several studies in education refer to and take an interest in particular products or ideas as larger examples of “innovations”; examples include Knight’s work on education hubs (2011), Glatter, Castle, Cooper, Evans & Woods’ work on innovations arising from school collaboration (2005), and a study by Zemsky & Massy on e-learning as an instance of “thwarted” innovation (2004). Studies have applied theories on the phases or movement of ideas (e.g. diffusion, change, etc.) to particular examples of innovations, such as Frank, Zhao & Borman’s study of the diffusion of computers in schools (2004), and Romiszowski’s study of the factors leading to the success or failure of educational technology innovation (2004).

The use of the term ‘innovation’ in a loose way in education is also interesting in that several kinds of ideas, practices, products and things talked about as ‘new’ or ‘innovative’ may have been tried and experimented with in the past. In that sense, what is ‘innovative’ in one setting may not be innovative in another. It may be a practice, idea or approach that had been tried several times, while nevertheless perceived as novel in that particular time and place. The innovation may be a re-packaging of an existing idea; it could be a new product, but it also could simply be a general idea for how a particular product should work or be implemented. The innovation as an idea may take the form of an educational practice, approach, modality, etc.

In addition, the outcome of the ‘innovation’ may be more difficult to measure. For instance, what may be considered to be effective and innovative in one context may be counter-effective and faddish (or widespread but possibly short-lived) in another; that the innovation could have different effects depending on the time, place, and population of the setting; that it may be difficult in fact to see whether or not the innovation itself has caused a certain outcome.

Take for instance the open concept classroom. Based on the British model and movement of “informal education” and consistent with social movements of the time, this innovation was all the rage in the late ‘60s and early ‘70s, adopted by boards and with new open spaces built across North America. The open concept idea quite simply removed the physical walls and dividers of the classroom; it was thought that this would assist in reducing authority and formality, where students would be able to creatively explore the “one room schoolhouse” space. Teachers acted as facilitators or coaches; spaces were designed to be pliable; and students navigated various ‘interest centers’ as self-directed and self-paced learners (Cuban, 2004). However, by the ‘80s much of the hype had died; in addition to a changing political and
economic climate, many teachers and districts were coming to the conclusion that, as appealing as its supporting ideas of collaboration, student-centeredness and respecting individual needs were, the experiment simply was not working well. Concerns rose around noise levels, chaotic spaces, and unsupervised learning. Walls were re-erected, often by teachers themselves.

First to consider in this example is the lack of clarity around the idea of open concept and its associated practices. The interpretation and enactment of an innovation may differ quite drastically by time and place. For one school an open concept space may have been designed as several structured learning centers planned by the teacher within the space, with facilitated group work, activities and instruction for students within a single grade level; at another the planning of the space could be an intentionally minimal design in order to allow multi-age and multi-grade students the freedom of movement, expression and curiosity within that space, and to maximize collaboration between teachers. Both represent open concept principles, but which better match the movement’s intent? Which model has a better impact and in which contexts? The complexity of the variables (arrangement of space; student age, ability and grade level mixtures; roles of teachers, etc) lends it a challenge to pull out the innovation itself from its many associated ideas and forms. In dialogues with teachers, emotions can be intense, in support or critique of the innovation, and in differences in the shared experiences. Below are a few excerpts from online education blogs:

Growing up I experienced both open-concept and traditional classroom design, and I actually prefer the open-concept style. Perhaps I'm better at focusing than some but I don't remember it being particularly noisy or chaotic. The 'rooms' were delineated by colorful cabinets, shelving etc and you couldn't really see into other 'classrooms.' I remember it felt light and airy, a much more cheerful environment than a closed room.

I went to school in the Cy-Fair school district in the 1970's and early 80's. I have not read the research, but I am able to tell you that I consistently had attention problems in my math classes because I was too busy listening to a history or language arts teacher in the adjoining area. Putting large numbers of kids and multiple subjects in the same area is plain nutty in my opinion. The only positive I can possibly think of for this model is that it probably cost less to build an open concept school versus a walled one.

Every school I attended while growing up - Spring ISD for elementary/middle, and Cypress Creek HS - were all built in the 1970s as open concept, but by the time I started attending (kindergarten in 1993), they had all erected the same kind of non-structural prefab metal wall panels. Most of them had large windows in the upper half, and one or more panels would have a door. Sometimes they would omit panels here and there in
order to create a shortcut between two or more classrooms. Some areas of my elementary school didn't have the prefab walls everywhere, so makeshift walls were made out of rolling cabinets, chalkboards, bookshelves, whatever.


This example shows that the effectiveness of and experience around an innovation can depend on how it is implemented and the many forms it can take. In addition, ideas are often re-packaged or re-surface in different versions; though the fundamental principles may remain the same, a slight twist in the approach or change to the model could result in the promotion of an innovation that looks very much like one in the past. For instance, as related to open concept, pockets of schools across North America continue to promote and experiment with similar models promoting them as innovative. Principles can be similar and overlapping, but it can be difficult to discern whether the approach is indeed something that is distinct from a past idea. For example, a popular education architectural design firm that has built over 400 schools in 36 countries, Field Nair International, advocates a learning community model that builds smaller clusters of spaces around common areas with minimal hallways and multi-use space areas. Lord Kitchener, an elementary school in Vancouver and one of the firm’s designs, has installed garage doors, high ceilings and natural lighting in a space (e.g. see http://www.theglobeandmail.com/news/national/canadian-schools-adopt-old-style-architecture/article4519536/ on some school designs based in Canada). In response to an article that argued that the organization supports a design similar to open concept, a member of Field Nair International posted the following comment:

We invite everyone participating in this blog to take a look and judge with your own eyes. This is not an open concept school…. What’s different about the design at Douglas Park and also Lord Kitchener School in Vancouver is that there is a greater variety of spaces, accommodating the needs of a diverse group of learners and also a diverse group of teachers. To that point, Fielding Nair conducted extensive consultations with teachers, including Best Practices and Curriculum Mapping workshops which did address concerns like acoustics and student distraction. The process has been well documented, with written narratives, timelines and images… In other words, this is a school that your
educators requested, thoughtfully and artfully customized to your community’s unique needs. A far cry from the superficial caricature of an open concept school that Bennett has drawn. The Design for Douglas Park Elementary is neither a re-creation of a failed experiment of the seventies or an experiment with Regina’s youngest citizens. It is a result of work done in your community and supported by more than two decades of hands-on experience in school design around the world.

As can be seen in this illustration, the underlying principles of an innovation or approach may overlap with old versions; changes to the approach may allow one to re-promote an innovation that looks quite similar to one already tried. Is this a rebranding of past ideas or is it really novel?

Innovation as a term may be used in a different way by discipline. For instance, in the hard sciences, it may be easier to distinguish what, in fact, is ‘new.’ For instance, if a soap manufacturing company develops a new innovation, a new kind of soap, that soap may be concretely different than the soap of its predecessor at the company or of its competitors. It may be the chemical components at an atomic level themselves that have been re-arranged into a more effective cleansing mechanism; it may be the combination of ingredients that is new and attractive; or it may be the overall design of the soap in shaping how it is used. But in some obvious way, the innovation itself would be considered and recognizably new. And the outcome of this innovation, the kind of newness, may be more easily measured. How much cleaner does the new brand of soap clean? How much easier is it to use? Or, do consumers tend to prefer its redesigned style? In education, what is considered to be ‘new’ may be the implementation of a practice in a slightly different form; the use of an innovation in a different context where it has not yet been tried; and the repackaging of a general idea.

There is complexity around considering what counts as an innovation in education. If one considers innovation to be something that creates a change and new in a sense to that time and place, an innovation can count as almost any kind of change one can observe or think of. In a classroom setting it could be as complex as implementing a new prescribed curriculum or as simple as a change in the physical set up or space of the classroom. When something is promoted as innovative, it may be presumed to be new, or more effective, or better in a kind of way that hasn’t yet been offered, but as can be seen, in the field of education, this is often not the case.

Therefore, while there are many ideas about what an innovation is and little consensus beyond the idea that it involves something actionable and new, for purposes of this thesis I
choose to define innovations more broadly as those ideas, practices, products and services that change the system in which they are introduced. Several examples of popularized innovations in education can be found in online, video and published material, for instance, in online blog posts (examples include http://penningtonpublishing.com/blog/reading/educational-fads-what-goes-around-comes-around/, an education reading specialist’s informal blog listing several fads he encountered in his practice and http://edphilosopher.wordpress.com/tag/education-fads/, a blog written by a doctoral student that explores why educators may be so susceptible to fads) and mass media publications such as the New York Times’ article on iPads in education (http://www.nytimes.com/2011/01/05/education/05tablets.html?_r=3&pagewanted=all), a 60 Minutes report on the Khan Academy (http://www.cbsnews.com/video/watch/?id=7401696n), and entrepreneur.org’s report on the Kauffman Education Labs Venture Program and its associated innovations (http://www.entrepreneurship.org/en/Blogs/e360-Blog/2010/August/Kauffman-Labs-Education-Ventures-Program.aspx).

Table 2 below categorizes examples of popular innovations in education by kind, for instance, a more general idea, a practice, or a particular product. Of course there are overlaps in these categories; a particular product may belong to a larger idea, practices may have associated products, ideas can be turned into products, and products may imply or require practices.

Table 2: Examples of Innovations

<table>
<thead>
<tr>
<th>Practice</th>
<th>Product</th>
<th>Idea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Character Education</td>
<td>Online Textbooks</td>
<td>Self-Esteem</td>
</tr>
<tr>
<td>Writing Across the Curriculum</td>
<td>TRIBES</td>
<td>Time on Task</td>
</tr>
<tr>
<td>Cooperative Learning</td>
<td>Green Schools</td>
<td>School Choice</td>
</tr>
<tr>
<td>Block Scheduling</td>
<td>Thematic Curriculum</td>
<td>Core Knowledge</td>
</tr>
<tr>
<td>Whole Language Instruction</td>
<td>Portfolio-Assessment</td>
<td>Global Education</td>
</tr>
<tr>
<td>Gifted Education</td>
<td>Laptop for All Students</td>
<td>Critical Thinking</td>
</tr>
<tr>
<td>Cultural Literacy</td>
<td>Open Space Concept Schools</td>
<td>Learning Styles</td>
</tr>
<tr>
<td>Timers</td>
<td>i-pad for all students</td>
<td>Brain-Based Learning</td>
</tr>
<tr>
<td>Social Media (blogs, imovie…)</td>
<td>Online Curriculum Database</td>
<td>Early Childhood Education</td>
</tr>
<tr>
<td>Experiential Learning</td>
<td>interactive whiteboards</td>
<td>Cultural Literacy</td>
</tr>
</tbody>
</table>

When considering ideas, practices or products that are referred to in the wider professional and popular discourses as innovations, it is important to also think about if they are in fact innovative. As discussed above, what is innovative in one context may not be considered to be innovative in another; an innovation may be considered to be novel but only in a particular
time and place; and what may once be considered to be innovative may lose this quality over
time as knowledge and advances are made. Despite these points, the idea, practice and/or
product may still be referred to as an innovation. As is reviewed above, definitions of
innovativeness and innovation often imply something that is done to disrupt current practices
and something that is unusual, a new kind of solution that creates some kind of change or that
meets a need for that particular context. Many things, practices, ideas and products in education
that are referred to as innovations may not be consistent with these definitions for different times
and settings or at all. Therefore, not all things referred to as innovations are actually considered
to be innovative.

**Selecting the Innovations**

The innovations I include in my two research studies are a variety of kinds of ideas,
practices and products. Each innovation can be represented or described by a practice and idea
and sometimes an associated product. They are all ‘innovations’ that are of relevance and
interest to classroom teachers, and can be readily implemented in their classrooms. These
innovations were chosen based on the following three criteria:

1. Popular and used/discussed widely (selection described below)
2. Able to be selected by individual teachers and
3. Relation to research evidence- the innovation needed to be either new without a
   substantial research base, or with some concerns about or controversy around its
efficacy as reported in the research literature

I identified the innovations through recommendations from colleagues, my prior
knowledge about the innovations, and online Google searches for popular education innovations
or education fads, as seen in the website links in the paragraph above the chart listing examples
of innovations. My intent was to look at innovations in wide circulation (in discourse and/or use).
A number of indicators could signal an innovation’s spread; for instance, the innovation may
have been widely used; it may have been the topic of frequent discussion in mass media outlets;
or it may have become popularized in several but not all areas of a country. My intent was to
find a range of criteria measuring ‘spread’; for instance, an innovation that is widespread is likely
to have garnered some media attention and have some discussion on social media (indicators of
amount of discourse happening around the innovation), as well as may have information
available about its number of users (indicator of how widely the innovation is used). The innovations I selected for the study needed to meet at least 4 of the 6 criteria listed below.

1. Presence of either a Twitter hashtag or Facebook page
2. A search for the innovation name and blog resulted in at least 10 blog entries and or/discussion Listservs and a Wikipedia entry
3. The innovation has been reported in at least 3 mass media outlets (at least 1 television program and at least 1 national newspaper)
4. The innovation has been reported at least five times as an article of focus in major popular education periodicals
5. The innovation has been produced over 100,000 hits for online Google search of the innovation name
6. The innovation had a user base of at least 100,000 individuals or 10 schools or 5 school districts (only if clear information is available)

Because large quantities of technology-based education innovations are being developed online (web 2.0 open access technologies, online learning platforms, software applications e.g. see Davis, 2012 on the growing investments being made in this area) several of the innovations I selected are examples of these kinds of web-based technologies (Khan Academy, Edmodo, iPads in the classroom, Curriki). These innovations are also digital kinds of innovations supported by some kind of device such as a computer or iPad (Khan Academy, Edmodo, iPads, Curriki) versus the others that are general practice ideas (invented spelling, Brain Based Education, irlen method). However, as discussed above, innovations can be presented in many ways. A Brain Based Education strategy or practice can be translated into a product that is supported by a particular device like an iPad or computer. For instance there may be an iPad invented spelling application or an online game that draws from Brain Based strategies. Teachers may respond differently to devices and digital kinds of innovations, however it is important to remember that, as discussed above, as there are overlapping ideas and innovations within innovations, innovations can also be translated into many forms, including products supported by various devices.

I also selected the innovations carefully based on the research supporting them, using those widespread kinds of innovations that are either newer and do not yet have a substantial research base (Khan Academy, iPad in the classroom, Curriki, Edmodo) and others that have been around for some time but are still widely used, the latter set interesting in that there have
been concerns raised and debates about their efficacy (Brain Based Education, invented spelling, Irlen Method). Several of these innovations are web-based innovations (Curriki, Edmodo, Khan Academy); others are practices supported by companies (Brain Based Education by Jensen Learning and the use of colored overlays by Irlen Method; iPad in the classroom by Apple); the final, invented spelling, is a general practice idea with descriptions provided by many web sites and articles on how to teach to it.

In order to assess the quality and quantity of research evidence available on the innovations, I did a search using the three comprehensive education databases CBCA Education, Proquest Education Journals and ERIC simultaneously. ERIC (coverage from 1966 and updated monthly), or the Education Resource Information Centre, “provides coverage of journal articles, conferences, meetings, government documents, theses, dissertations, reports, audiovisual media, bibliographies, directories, books and monographs” ([http://www.csa.com/factsheets/eric-set-c.php](http://www.csa.com/factsheets/eric-set-c.php)) and is a frequent source for education researchers. Proquest Education Journals (coverage from 1991) includes access to 1020 popular education publishers and, as with ERIC, provides content at all levels of schooling and in a range of subject areas ([http://www.proquest.com/products-services/pq_ed_journals.html](http://www.proquest.com/products-services/pq_ed_journals.html)). CBCA education (coverage from 1977) focuses on Canadian content, with over “150 Canadian education periodicals plus education articles in over 700 Canadian journals and newspapers” ([http://www.library.ualberta.ca/databases/databaseinfo/index.cfm?ID=135](http://www.library.ualberta.ca/databases/databaseinfo/index.cfm?ID=135)). I searched for the innovation name in the title of the document and recorded the number of peer reviewed journal articles available on the innovation through this search, as a proxy for the quantity of research available on the innovation. I then reviewed the results of several of these articles, if available. In the case that no or few research studies were available, I also did a search for the innovation name ‘anywhere’ in order to search for the innovation anywhere within the documents. Finally, in the case that I could find no or few research studies in the database searches, I conducted an additional Google search for the innovation name along with the term research. While this search process is not exacting, it did provide me with a general sense of both the quantity as well as kinds of studies available on the innovations. It was beyond the scope of this thesis, however, to do a comprehensive synthesis of research supporting each of the innovations.

All the innovations can take many forms, e.g. handbooks and toolkits, videos and lesson plans. Below I provide descriptions of each innovation along with an associated web link I use to
represent the innovation (either the website offering the innovation itself or a web link providing a description of the innovation). I also relate them to the discussion about innovation above, along with a brief discussion of my search on the research evidence supporting them.

**Khan Academy** - [https://www.khanacademy.org/](https://www.khanacademy.org/) Funded by the Gates Foundation, presented on the television show 60 minutes, tweeted over 28,000 times (as of June 2012), and with millions of independent users (as reported on its website), this innovation has moved from the individual user level (students at home looking for supplementary learning tools online) to whole schools and districts that are experimenting with its approach (http://www.cbsnews.com/video/watch/?id=7401696n). The Khan Academy is a non-profit organization that offers brief video lesson clips with simple visuals online free of charge, in several languages, across a range of subject areas including math, science, economics and the humanities.

The Khan Academy offers over 3200 (and growing) brief video lesson clips online available for free; the videos are in a lecture format with voice in the background coupled with a multimedia video (e.g. writing the lesson as the instructor speaks about the lesson) and providing content on a range of topics from elementary to advanced, in math, science, humanities and finance, and in several languages. For instance, an instructor might speak through how to solve a math problem while the accompanying video includes the instructor writing out how to solve the problem. This web-based innovation has grown to offer other resources, that also can be considered innovations, including a “map of knowledge” (a map of challenges, skills and concepts connecting video concepts together) and a “your stats” feature that provides at-a-glance information on what has been learned, progress on problems and time spent. In the Khan Academy, the innovation is not a single educational video online, which of course is a method that has been used extensively, but rather the approach of providing several hundreds of videos online in brief lecture-based clips format supplemented with simple visuals.

However, to complicate this, a larger idea called “flipping the classroom” may also be considered the innovation associated with and supported by the Khan Academy. “Flipping the classroom” is an approach where students watch videos or instructional materials online at home as a form of self-instruction; they then meet as a class to review problems, and discuss questions or ideas related to the instruction, rather than using class time for this purpose. It is suggested by
several media sources that this approach increases the quality of student-teacher interaction and student engagement, as well as allows students a mastery approach where they are able to learn at their own pace from home (rewinding videos, etc). Class time can then focus on students’ individual needs. “Flipping the classroom” is an example of an innovation that is not a concrete product but rather a general approach/idea; it is also an example of an innovation that has been explored in several settings in education, and therefore not really ‘new.’ Rather, it may be considered innovative in the sense that it has not yet been adapted in a particular way in the wider education community.

A search for “Khan Academy” for document titles in the databases resulted in three hits for peer reviewed journal articles on the innovation. However, after reviewing the three articles, I saw that none were designed as research studies testing the innovation’s effectiveness, but rather discussed and promoted the innovation more generally. I broadened my search to “Khan Academy” searched ‘anywhere’ and still only generated three hits for peer reviewed journals. A search for “Khan Academy” and research on Google resulted in one hit for a Gates-funded report by SRI International reporting implementation research on Khan Academy from a two-year pilot program at 20 public, charter and independent schools in the 2011-2012 and 2012-2013 school years (however the research did not report an evaluation of the impact of Khan Academy on learning). A research brief published in March 2014 (http://www.sri.com/sites/default/files/publications/2014-03-07implementation_briefing.pdf) summarized the results including implications; according to their study results, Khan can be implemented “under different time and technology constraints;” teachers “want to maintain responsibility for leading instruction; and most students were not familiar with working independently in the process (SRI Education, 2014, p. 15-16). The Google search also shows that several school districts are piloting Khan Academy, such as a first statewide pilot in Idaho (http://www.informationweek.com/software/khan-academy-launches-first-state-wide-pilot-in-idaho/d/d-id/11088862). However, it is clear from the search that Khan is a new innovation that does not yet have an established research base.

Curriki - http://www.curriki.org/ Founded in 2006, Curriki offers thousands of free teaching resources (lesson plans, etextbooks, assessment activities, videos, simulations, etc) and curricula (according to its website, over 50,000 resources) across grade levels and subject areas. Teachers
can search for resources by topic, grade level, resource type and other categories; its members publicly rate each resource. According to its website, Curriki has been supported by a number of generous donors; has initiated partnerships with Nassau BOCES School District in New York, Eco Charter school in New Jersey, and with educators as part of the “Curriki Summer of Content;” and has over 8.7 million users from 194 countries (http://www.curriki.org/welcome/wp-content/uploads/2013/07/07.03.13-Curriki-At-a-Glance-update.pdf)

Many sites promote the sharing of resources between teachers (e.g. www.sharemylesson.com; www.teacherswithoutborders.com; www.teacherspayteachers.com; learnzillion.com). The advent of the World Wide Web, as cited above, allows for a huge quantity of resources and innovations to be shared in an open access manner, free of charge (Carrier et al., in press). The idea of collaboration and collaborative school cultures is well developed in the literature and considered to be an important quality to develop in schools (Fullan & Hargreaves, 1991). However, the systematic collection, organization and sharing of free resources via the Internet, reviewed by “experts” such as retired teachers, and rated by the users themselves, is a combination of variables that make the innovation Curriki a unique version to these existing ideas. Curriki is similar to Khan Academy in that resources are provided in an open access manner, however Khan Academy targets students and offers lecture-clipped videos, while Curriki provides instructional resources to teachers often in the form of lesson plans and other text-based formats.

A search for “Curriki” for document titles in the databases resulted in one hit for peer reviewed journal articles on the innovation. As with Khan Academy, this hit did not report research findings about the innovation. A search for “Curriki” anywhere resulted in twelve hits for scholarly journals. One of these articles explored “wiki technology” or web 2.0 technology, of which Curriki would be a part, and how a students’ backgrounds such as age, gender and experience influenced and correlated with satisfaction of use (Hazari, North & Moreland, 2009), however did not focus on Curriki. None of the other articles researched the impact of Curriki technology, but discussed or mentioned it in passing within the article. A search for “Curriki and research” on Google also did not result in any hits of research studies about the innovation in the first forty hits listed, showing that this also may be a newer kind of innovation that does not yet have an established research base.
**Edmodo**- [https://www.edmodo.com/](https://www.edmodo.com/) Founded in 2008 and with over 33 million users, Edmodo is a site, with a design similar to Facebook, that offers collaborative tools for the classroom, including a communication platform, a variety of learning applications to supplement classroom instruction, and assessment tools such as quizzes and polls. Its website states that Edmodo has won several awards from various associations (American Association of School Librarians, Tech and Learning, eSchoolNews, etc) and has been featured in articles in the Huffington Post and Chicago Tribune. Like Curriki, Edmodo focuses on using web space to enhance collaboration, this time with a focus on collaboration between teachers, students, their parents, and others, for both resource sharing and communication.

A search for “Edmodo” for document title names in the databases resulted in one hit for peer reviewed journal articles on the innovation, also not designed as a research study assessing Edmodo’s impact on student learning. A search for “Edmodo” anywhere in the databases resulted in fifty-three hits for peer-reviewed articles over the past five years (starting from 2009). However, after skimming these results, I was not able to find any research articles focusing on Edmodo and assessing its outcomes or impact through a systematically study design; however, as with Curriki, several of the articles discussed using Edmodo in various ways or mentioned Edmodo as an example in passing. A search for “Edmodo and research” in the first forty hits on Google resulted in a study comparing student preference for Edmodo with a program called Moodle (another online learning platform) and a graduate thesis exploring Edmodo’s influence on student engagement (the study included 42 participants who were surveyed) showing positive results in encouraging student engagement and responsibility (Jeffries, 2012).

**Invented Spelling**- [http://www.readingrockets.org/article/267;](http://www.readingrockets.org/article/267;)[http://www.greatschools.org/students/academic-skills/384-invented-spelling.gs](http://www.greatschools.org/students/academic-skills/384-invented-spelling.gs) Invented spelling is an approach that encourages students to write freely without attention to the spelling of words that might disrupt the flow of writing and expression of ideas. Invented spelling is based on the idea of “holistic” instruction and allowing students freedom of expression, independence and risk taking- in essence, enabling children’s creativity to flow (Caine & Caine, 1995; Webjen, 2010). It is consistent with a constructivist approach to learning, an instructional idea and educational philosophy that advocates students to build their own understanding and knowledge
through an active process of learning. This idea is a foundational principal in several areas such as constructivist mathematics, inquiry based learning and cooperative learning. Invented spelling is a practice that can be represented by various kinds of lesson plans, guides and other curricula, with various organizations providing resources on and supporting its approach.

A search for “invented spelling” for document title names in the databases resulted in forty-nine hits for peer-reviewed journals, beginning in the late 1970s to the present. A scan of the results show several studies reporting gains through the use of invented spelling (e.g. Senechal, Oellette, Pagan & Lever, 2012) however many hits were not relevant in terms of reporting findings. A search for “invented spelling” for document title names in Google Scholar resulted in one hundred seventy-eight hits. Some studies such as Berninger, Vaughan, Abbott, Brooks, Rogan, Read Y& Graham (1998) show that invented spelling may only be effective at a certain stage of development and where other spelling strategies may be more appropriate for more advanced learners; another article points out that while invented spelling is supported by research, “the merits of invented spelling are still vehemently debated (Gentry, 2000, p. 318).” While there are many studies that report positive gains through the use of invented spelling, it appears to be an approach that is still debated; how it is used (age group and instructional approach) is important.

**iPad in the classroom**- iPads are featured on Apple’s website as a tool for use in the classroom ([https://www.apple.com/education/ipad/teaching-with-ipad/](https://www.apple.com/education/ipad/teaching-with-ipad/)). iPads offer over 65,000 applications targeted towards teaching and learning, including a variety of multimedia, note taking, presentation, assessment and many other tools. Apple’s website also offers various resource guides for using the iPad, including the use of applications, iTunes university, iBooks, and on “exploring education content for iPad.” ([https://www.apple.com/education/ipad/resources/](https://www.apple.com/education/ipad/resources/)) iPads in the classroom is a general idea (using the iPad) but can be represented by innumeros educational applications. Student engagement and interactivity, customized, self-paced learning, and moving beyond a one-dimensional textbook are all ideas that are used to support the value of this innovation. Though research in this area is still in its infancy (e.g. see [http://www.msdf.org/programs/urban-education/initiatives/united-states/blended-learning/](http://www.msdf.org/programs/urban-education/initiatives/united-states/blended-learning/) for recent case studies) blended-learning models (combining digital and other instruction), similar to that offered by iPad, is a popular
instructional idea; the portability, multiple functionalities and innumerable education applications offered by the iPad make this kind of tool different.

A search for iPad in the classroom (not quoted) for document titles in the databases resulted in one hit for a peer-reviewed journal, however this article did not report research findings. However, a search for iPad in the classroom ‘anywhere’ resulted in a much larger scope of hits with for hundred ninety-three peer reviewed journal article hits starting from 2002 and picking up intensively, moving from sixteen peer reviewed publications in 2010, sixty one peer reviewed publications in 2011, one hundred twenty-two peer reviewed publications in 2012, and one hundred fifty-six peer reviewed publications in 2013. I selected 2013 as a most recent and complete year of publications and reviewed the first twenty publications listed. Of the twenty studies, four reported positive results with the use of iPads in various scenarios (Cavanaugh, Hargis, Kamali & Soto, 2013; Retter, Anderson & Kieran, 2013; Wallace & Witus, 2013; Ward, Finley, Keil & Clay, 2013). These were the only studies in the twenty that assessed the iPads’ impact on student engagement, learning and other outcomes; there were no studies in this listing that demonstrated negative results. The other hits either discussed use of the iPad or described it in passing, but did not focus on assessing its effectiveness. As described above, it is beyond the scope of this thesis to do a full review of research studies on iPads, however from this review I could see that the research on iPads has been quite recent and growing rapidly, as might be expected, as it is a newer kind of innovation. However, it is important to note that many of the four hundred ninety-three peer-reviewed hits may also not be relevant in the reporting of study outcomes through use of the iPad.

Irlen Method- [http://irlen.com/](http://irlen.com/) Founded in 1983 and with over 170 clinics, the Irlen Institute is an organization that provides ‘Irlen filters’ or colored overlays and lenses to address Irlen Syndrome, a perceptual processing disorder. The company offers diagnostic services and addresses a range of issues including reading problems, headaches, ADHD, autism, brain injury, low motivation and medical conditions. According to its website, Irlen spectral filters are “individual, precision-tinted lenses that filter out the offensive wavelengths of light, allowing the brain to process visual information correctly” where the filter color is determined by a patented testing process to address the specific issue. As quoted on its website, “The Irlen Method has received international acclaim and is included in professional journals and textbooks. It has also
been featured in national and international media, including National Geographic, 60 Minutes, Good Morning America, ABC World News, NBC News, the BBC and TV shows in Ireland, Hong Kong, Netherlands, New Zealand, South Korea, and Australia” (http://irlen.com/media/). Irlen is a for-profit company; costs vary with prices for screening, evaluation and purchasing of the filters (hundreds of US dollars or more); benefits are the potential improved learning outcomes of the student who uses the filters.

A search for “Irlen method” in document titles in the databases resulted in no peer-reviewed hits. A search for “Irlen” in the document title name in the databases resulted in nine peer-reviewed journal hits. Of the nine articles, four reported results assessing Irlen overlays, two showing no benefits (such as easing reading difficulties) from the use of the overlays (Blaskey, 1990; Ritchie, Della & McIntosh, 2012) and one showing positive results (Robinson & Conway, 1990). In one of the articles the author reviewed three studies evaluating the effectiveness of overlays on those with reading difficulties and reported in its abstract “carefully designed and controlled studies do not currently lend support to the Irlen Hypothesis (Solan, 1990).” A more general search for color overlay and ‘anywhere’ within the documents in the databases resulted in one peer reviewed journal hit (Ludlow, Wilkins, & Heaton, 2006) reporting slight benefits associated with using colored overlays (15 out of 19 children with autism showed a 5% increase in reading speed while only 3 of 19 children in the control group showed this increase). I conducted an additional search for Irlen for document titles in Proquest Social Science Journals to reach studies published outside education, resulting in sixteen peer reviewed journal hits; I also searched for Irlen ‘anywhere’ in the documents for a total of fifty scholarly journal hits with a peak of research occurring in 1990 (7) and ranging across to 2014 (however, as with the other searches above, many of these hits may not report research study findings). From my search I could see that many studies have been done testing Irlen syndrome but with contradictory findings, some reporting benefits and others not. Overall, Irlen Method does not appear to be an approach that shows consistently positive results across studies.


Founded in 1994, Jensen Learning is a for-profit organizations that offers workshops, products (dvds, books, videos, etc), and certifications for a fee, that are based on the brain based approach, one that supports the use of strategies based on what is known about how the brain functions
optimally. Its website includes a list of schools where teachers are implementing brain based approaches (http://www.jensenlearning.com/schools.php). Brain Based education includes many kinds of practices that can be implemented in different ways, some of which are general ideas, others that are more concrete actions, ranging from, for instance, changing the temperature, wall colors, lighting, scents and seating arrangements in a classroom (Sikora, 2013) to other tactile techniques related to the use of movement, art and music to support and optimize brain performance and learning (Hobbs, 2007). Similar to invented spelling, “holistic” and “personalized” and “student-centeredness” are principles commonly espoused by those who advocate this approach.

A search for Brain Based education (not quoted) for document title names in the databases resulted in six peer reviewed journal hits. Of these six hits, none systematically assess Brain Based approaches and report findings. Three of the articles discuss cautions and concerns about brain based approaches, stating, for instance, that claims are too broad, oversimplified and the result of misinterpretations of complex neuroscience research (Alferink & Farmer-Dougan, 2010; Colburn, 2009; Davis, 2001). The other three discuss Brain Based approaches and its uses positively, one written by the founder of Jensen Learning, Eric Jensen (Jensen, 2012; Magnuson, 2002; Persellin, 2010). A search for “Brain based education” ‘anywhere’ in the documents in the databases produced thirty eight peer reviewed journal hits; a scan of these results shows similar hits- articles that discuss the brain based approach in various contexts, taking either a skeptical and questioning or supportive approach. Through my scan of these results, I could not find research studies assessing the effectiveness of the brain based approach, leading me to believe that much of the research and claims being made are drawn from findings in neuroscience and then applied to education.

These innovations illustrate my discussions about the meaning of innovation above- that what is innovative in education can be defined quite expansively, inclusive of ideas, practices, and products, where an innovation can be represented by each of these forms; many aspects of a particular innovation may not be new, but based on other foundational ideas, where the innovation may be similar to other kinds of innovations and considered to be new from the perspective of the adopter. Hence, most if not all innovations in education contain multiple innovative elements; it’s not only the ‘whole’ that is an innovation, but also some or all of its parts and perhaps, the ways those parts are combined or the way they are taken up in particular
settings. From one example of an innovation we might see an abundance of separate things, ideas, approaches advertised to be different kinds of innovations when really they are versions of the same idea.

**Innovation Spread and Adoption**

In this section, I review relevant literature on innovation spread and adoption, and introduce a set of qualities I use as a framework to guide my two studies, drawn from the research use and social psychology literatures.

The question of how innovations can be introduced and sustained is not a new one. A classic body of work has developed in organizational sociology and social psychology exploring how ideas and practices diffuse in systems. Such work includes Everett Rogers’s classic scholarship examining innovation diffusion in stages (generation, decision process, adoption…) (Rogers, 1962); organizational theories that metaphorically compare idea movement to population ecology processes (Hannan & Freeman, 1984; Meyer & Rowan, 1977); and scholarship exploring the translation process of ideas as they circulate (Czarniawska-Joerges & Sevón, 1996; Sahlin-Andersson & Engwall, 2002). Other scholars draw on institutional theory and the role of ‘carrier’ systems on the movement of ideas (Dimaggio & Powell, 1983; Scott, 2003). Scholars in education have explored these ideas with conceptual and empirical work on innovation implementation (Berman, 1981; Berman & McLaughlin, 1976), stages of the education change process (Fullan, 1993; Fullan, 2001), district reform (Anderson, 2006), and the dissemination and institutionalization of reform efforts (Anderson, 1996; Curry, 1991; Miles, 1983).

One might consider the movement of an innovation as occurring through time and several stages. For instance, the innovation can move through a process of initiation (the generation of the initial idea), circulation (the spread of that idea), implementation (the adoption or putting into practice the innovation) and institutionalization or fizzle out (whether it stays around in whole or part and for how long). This is one model, but there are several others proposed in the education literature on the general idea of innovation and change. A few notable ones include Miles’ Initiation-Implementation-Institutional factors (Fullan, 2001), Berman’s mobilization-implementation-institutionalization framework (Berman, 1981) and Fullan’s ideas around the causes and processes of initiation in educational change (Fullan, 2001). These stages
are often applied to an educational reform effort, which may in turn be a proposed innovation of one form or another, such as a changed practice or introduction of a product.

To review these popular frameworks in brief, Miles’ Triple III (reviewed in Fullan, 2001) examines the effectiveness of reform efforts not simply in outcome metrics, but from systemic and staged processes as the policy is carried out. The effectiveness of a reform effort can be evaluated by considering the inclusiveness of the elements of each stage of the model. These elements can be considered forms of evidence indicating the likelihood of success for each case. For instance, was the effort linked to a high profile need, the political and school based needs aligned (initiation)? Was ongoing technical assistance provided (implementation)? Most importantly, was the innovation embedded, by, for example, being integrated into the timetable, roles, budgets and mission statement of the organization (institutionalization)? These process characteristics provide a simple and generalized theory by which to analyze the degree of implementation (and relative effectiveness) of a reform effort at the organizational level.

Berman’s paper (1981) on the educational change process includes the three stages of mobilization (system prepares for change), implementation (system attempts a changed state), and institutionalization (system stabilizes into the changed state). This theory also includes resulting states of institutionalization, suggesting that an innovation may have different levels of sustainability (not completely die out, however not implemented in full as intended either). For the latter stage, Berman describes states of mutual adaptation (changed existing practices); co-optation (change does not really take place and is mapped onto existing practice); symbolic implementation (visitors can see change efforts, but no practical change has taken place); and technical implementation (pre-scripted programs forcing certain technical changes).

Anderson (1996) has written on the processes of dissemination in education, or the “deliberate efforts to transfer knowledge about education programs and practices across education settings (i.e. classrooms, schools and districts) (p. 282).” As a form of knowledge diffusion, he outlines the following associated dissemination stages 1) spread (transfer of knowledge as information, products, ideas, and materials) 2) exchange (two-way flow of information) 3) choice (selection of knowledge) and 4) implementation (adoption of the innovation) (Anderson, 1996, p. 282). This model includes the stage of ‘choice’ or selection of an innovation not apparent in the previous examples.
Within the context of these various stages, studies may examine one stage in particular in reference to a particular innovation. For example, Anderson has examined the institutionalization of a restructured high school (Anderson & Stiegelbauer, 1994), as well as the management styles of implementation across more than one innovation in a school (Anderson, 1991). Glaser (1981) researched the durability of innovations in human service organizations with a three-staged process of initiation-implementation-incorporation (similar to Berman’s stages however with the term ‘incorporation’ in lieu of ‘institutionalization’), using the idea of ‘routinization’ or how practices become standardized, to describe the adoption of a practice. Kirst & Meister’s (1985) work on reforms that were sustained in American secondary schools and Curry’s (1991) conceptual discussion of institutionalization look at the final stage of the change process.

Several studies in education have applied theories on the movement of innovation to the study of kinds of education innovations, sometimes labeled as fads. For instance, Zemsky & Massy (2004) as part of the ‘Weatherstation Project’ at the Learning Alliance, University of Pennsylvania sought to explore the hype around e-learning and answer the question ‘why did the boom in e-learning go bust?’ in postsecondary education. They describe e-learning as one of the three main educational innovations that have taken hold in education in the past decade (the others they define as high-stakes testing/accountability and international ranking systems), with its potential for a student-centered, design rich, any time any where approach. As they explain of this much discussed innovation, it “was the innovation that garnered the most venture capital, the most press and not surprisingly, the most grandiose promises (p. 1).” Drawing on the theory of diffusion (Rogers’ work, specifically the stages of adoption), the researchers explore how online learning took hold (large investments in the hardware/software necessary) at six postsecondary institutions in the United States and eventually went bust. Hoping to explore the changing state of e-learning at these institutions over time, the researchers conducted surveys with administrators and faculty, asking questions related to the frequency of use of e-learning, its current state of growth, its value or benefit, support for e-learning at the institution, etc, along with tracking the e-learning providers and their relevant services at various places across the campuses (departmental program, human resources, information technology, sales, etc). While there are many critiques of this paper (e.g. biased sample, unclear definition of e-learning), discussed on quite a few online Listservs, reviews, and blogs, and its conclusions contested, it
nevertheless demonstrates the approach of applying one theoretical lens on the movement of ideas to a particular case of a faddish type innovation in education. It also provides an example of just how contentious it can be to label an innovation a fad.

Renzulli & Roccigno (2005) also apply a diffusion lens to the case of charter school policy implementation across the United States. Drawing on several data sources, including event-history analysis, and via binomial regression, the researchers found a strong ‘mimetic’ tendency (this idea derives from institutionalism) amongst states in their adoption of charter school legislation, with other internal attributes, such as strength of the teachers’ union, level of urbanization, competition between public and private school sectors, political party dominance, and others playing a role. As with Zemsky & Massy’s work, this study was interested in how this innovation diffused, or traveled, over time.

Rogers, McManus & Kim (1985) examined the diffusion of ‘microcomputers’ in nine schools located in the California Bay area, focusing on the process of behaviors and decisions leading to the acquisition of this innovation and their subsequent implementation. They discovered that external pressures, rather than internal instructional practices, pushed educators to adopt and integrate this resource into instruction, though as they anticipated, this technological innovation has not disappeared.

Frank, Zhao & Borman (2004) applied the diffusion lens to a study also looking at computer technology in schools; they centered in on the communication processes of the diffusion theory by examining educators’ changed perceptions of the innovation through perceived social pressure and access to expertise. Finding that the social capital make-up of the school could be quite influential in the circulation of an innovation, they argue, “Change agents should attend to local social capital processes that are related to the implementation of educational innovations and reforms (p. 148).” This study points out, at an individual level, the influences of peers and the social setting in the perception and consequently circulation of an innovation.

Several journalistic articles have explored particular cases of innovations as well. For instance, Cuban has written articles on school time in Phi Delta Kappan (2008) and the open classroom (2004) in Education Next. In the former, Cuban explores the reasons behind why reformers continue to press for fixing time in schools (such as implementing longer school days) despite the lack of evidence to support these approaches. Concerns about whether students are
spending enough time to develop the skills necessary to be competitive; international test score comparisons with countries who typically implement longer school years; and critiques that teachers need more time on professional development, along with pressures from widely publicized reports such as a Nation at Risk (1983) and Tough Choices, Tough Times (2007), Cuban explains, are all attitudes that may contribute to a “tinkering” of time schedules in reforms, regardless its failed track record (p. 241). In the other article, Cuban places the innovation of the open classroom in its historical context, pointing out how this approach, while for the most part is considered to have died out, has been re-introduced and is indeed thriving in several schools across the United States at the time he wrote the paper. Cuban has also explored why certain innovations have sustained, such as the institutionalized reform of kindergarten (1992).

Overall, these studies suggest that there may be several explanations for why innovations in education diffuse and become widely adopted over time, including larger political and social pressures, the presence of widely held beliefs, and the influences of social capital and one’s peers. While these studies focus on particular cases of innovations, my study takes an interest in ones that are widely promoted (in either discourse or use), examining the evaluative and perceptive processes of teachers as they encounter several of these innovations as well as the selling of them in various kinds of media. However, these explanations (e.g. importance of interpersonal relationships in finding and deciding what innovations to use) are important to consider when thinking about the evaluation or marketing process as well. In this thesis I draw on literature exploring how educators encounter innovations, their experiences with evidence related to particular innovations, and how these innovations are in turn marketed, presented in the framework I use to guide the two studies included in this thesis, below.

**Conceptual Framework**

In this thesis I draw largely on two bodies of literature: research use scholarship that aims to strengthen connections between research, policy and practice (e.g. Estabrooks, Derksen, Winther, Lavis, Scott, Wallin, Profetto-McGrath, 2008; Lavis, 2006; Nutley, Walter & Davies, 2007), and literature on marketing and the social psychology of persuasion (e.g. Briggs & Stuart, 2006; Cialdini & Trost, 1998; Kahneman, 2011; Wood, 2000). From these literatures, I synthesized a set of six qualities (credibility, evidence, accessibility, practicality, appeal, compatibility) I use to guide the two studies in this work. These literatures speak more closely to
individual interpretation- how to reach and influence individuals, in the promotion of the innovation, and how that individual in turn interprets the innovation, and factors that may influence this interpretation. On the other hand, the literature cited above on the spread and adoption of innovations examines this process at a system or organizational level; however, some qualities that assist in an innovation’s spread as seen in these literatures (such as the influence of one’s peers and social pressures) overlap with the qualities I describe in the framework below. I discuss these overlaps following the review of these two bodies of literature (research use and marketing/social psychology of persuasion), below.

The research use literature crosses disciplines (social sector, health, education, etc) and has been titled and defined differently (knowledge transfer, management, exchange & research utilization/dissemination/diffusion, etc) reflecting on the conceptual framing underpinning the various fields. Objectives include to 1) build the users’ capacity to access, interpret, evaluate, and use research 2) enhance the relationships between producers and users and 3) develop methods by which research can be more effectually communicated across organizations thereby increasing its access and the likelihood of its use. My search located no studies in the area of research use on how educators evaluate innovations, with a focus on the research provided behind them; however, several relevant studies in education touch on educators’ interpretation of educational research (Borg, 2009; Cordingley, 2008; Joram, 2007; Pajares, 1992; Williams & Coles, 2007) and on their specific preferences, needs and desires around its format of presentation (Blamires, Field & Wilson, 2010; Cordingley, Bell, Evans & Holdich, 2005; CUREE, 2003, 2007; NTRP, 2000). In general these studies show that there are several barriers to educators accessing, interpreting and putting to use research; they also demonstrate that educators report very particular preferences around its format of presentation. Given that evidence can be embedded and marketed within innovations, this literature is relevant as it speaks to how educators evaluate whether or not the evidence behind the innovation is sound and how its presentation may influence an educator’s perception of its quality and usability.

The second body of literature I draw from is in the area of marketing, which encompasses a broad scope of activities including analyzing customer needs, competitors in the market, organizational competencies, and the cultural, technological and legal context (Dolan, 1997). Marketing can be defined more generally as “an organizational function and a set of processes for creating, communicating, and delivering value to customers and for managing customer
relationships in ways that benefit the organization and its stakeholders.” (American Marketing Association, n.d.) There is a very large industry behind marketing and around the psychology of persuasion, appealing to individuals’ identity and emotions and paying particular attention to how information is communicated. It also is concerned with various steps in developing, promoting and selling products, such as opportunity identification, distribution channels, product design and testing, pricing, and strategy (e.g. segmentation/targeting). Advertising, or persuasively communicating product value to customers in order to shift attitude and compel a purchase (Funkhouser & Parker, 1999) is a branch of marketing that may offer some insights into how, from the producer end, products are designed in ways that are more persuasive and effective in terms of influencing behavior and in their likelihood of use.

Advertising is a complex endeavor, however, and identifying what is ‘effective’ practice can be quite difficult for several reasons. Consumers, for instance, may choose to purchase a product for a variety of reasons, including a sales promotion, the price, and word-of-mouth reference, not simply because of the advertisement itself. Advertisements also occur across various kinds of media each with a different set of customers. Responses to the advertisement may vary based on the targeted consumer segment (Tellis, 2004). Despite this complexity, several marketing texts list general features to consider in the design of a product and in its communication including a consideration of the needs of customers, the company’s reputation, testimonials and technical support, convenient availability, and an appealing and credible brand name (Perrault, Cannon & McCarthy, 2010).

There also exist several frameworks one could turn to when considering how to better communicate the ideas and benefits behind the product itself; these ideas are at a more abstract level in order to allow application across a number of situations and cases. For instance Heath & Heath in their popular book Made to Stick list simplicity, unexpectedness, concreteness, credibility, emotions and stories as important elements (Heath & Heath, 2007). Shell & Moussa (2007) in reference to effective persuasion also point to the importance of credibility and trust in influence, taking the time to understand the customers’ beliefs and values, providing incentives, and personalizing it by for instance, telling a story or describing things vividly and with emotion (Shell & Moussa, 2007). Briggs & Stuart (2006) mimic some of these thoughts in their book What Sticks including understanding the customers’ evolving needs and motivations (e.g. rational, physical, emotional, fictional), and making sure the message connects to the brand and visual imagery and
is straightforward. Other overlapping themes include surprise, appealing to emotions, showing rather than telling, using humour, metaphor or story, and originality (http://www.spoonfeddesign.com/10-principles-of-effective-advertising) and making emotional appeals, using story and symbolic language and images that appeal to the senses (http://americanresearchgroup.com/adrules/).

The social psychology of influence and persuasion lies at the heart of marketing communications, which explores how people can be guided to adopt or gravitate towards ideas and behaviors (Ajzen, 1992; Cialdini, 1994; Wood, 2000). Often work in this area delves into individuals’ motives (Cialdini & Trost, 1998; Deutsch & Gerard, 1955). Motives often serve specific functions, for instance, ‘accuracy’ motives are concerned with maximizing rewards and minimizing punishment, ‘self-concept’ with protecting one’s ego and ‘social relation’ with fitting and adjusting in their social environment (Wood, 2000). It is also possible for people to have multiple motives where “people’s attitudes can reflect diverse evaluations (Mackie & Smith, 1998), cognitive representations and interpretations, and affective reactions.” (Wood, 2000, p. 549) Being strategically persuasive means understanding and tapping into peoples’ motives.

From these two bodies of literature, I generated six qualities that I used as a framework, to understand how teachers evaluate innovations and to guide to the content analysis of text promoting the innovations. While reviewing these literatures, I focused on ideas that seemed to appear frequently, from the research use literature, particularly on educators’ interpretations of research and in their preferences around format of presentation, and from the marketing literature, on how products can be crafted to appeal to consumers. In education, there is a dearth of research on how teachers evaluate particular innovations; because I am interested in the evidence supporting the innovations, I draw from the research use literature in education on teachers’ preferences around the format of presentation of research, research-based resources, and research products. I in turn apply these qualities to the understanding of how they evaluate the innovations and the evidence supporting them. As described above, given the increased attention and dialogue around research evidence and its use in policy and practice, and in my particular interest in this theme and its relation to innovation, in the findings of the two papers I emphasize and discuss the quality of ‘evidence’ in relation to the other five in more depth (in the paper on how teachers evaluate the innovations, how they speak about the importance of evidence in relation to the other qualities, and in the paper on innovation promotion, how the
media uses various forms of evidence to support use of the innovation). The six qualities are listed below with a description and examples.

Evidence - this refers to the teachers’ assessment of the quality of the research supporting the innovation itself. Indicators of quality evidence may influence judgments, including the presence of citations, testimonials from experts, and references to different kinds of studies, as indicators of the research’s quality (Litman 2012; Reid & Gough, 2000).

Litman (2012) outlined several considerations when evaluating research quality, including author background, accuracy of presented information, sources and documentation used, and the relevance of the research to one’s work. Of course, as described in the Joram’s (2007) paper above, this kind of evidence may be less important to teachers than other kinds specific to their teaching practice.

Compatibility - Teachers tend to prefer research that is compatible with their prior understanding and experience as an educator. Teachers are less likely to pay attention to evidence in areas where they have deeply held beliefs, particularly if this evidence is not consistent with these prior beliefs and experiences (Borg, 2009; Joram, 2007; Honig & Coburn, 2008; Levin, 2004).

As an example of how experience may influence one’s perspective on research, Joram’s (2007) study “Clashing Epistemologies” explored the differences between pre-service teachers’, practicing teachers’ and teacher education professors’ beliefs regarding research. Drawing on responses to vignettes and semi-structured interviews, the researchers found very different worldviews and outlooks towards research between the three groups. Pre-service teachers tended to prefer information that was specific to their teaching practice, such as classroom instructional strategies; their views on research reflected a cultural orientation that was more “normative, personal, particular, and experiential,” whereas the professors tended to have an outlook that was “analytical, intellectual, universal and theoretical” (Labaree, 2003 as cited in Joram 2007, p. 125). Personal experiences as either a practitioner or scholar, therefore, had a strong role in influencing beliefs about research, where each group reflected different views about research.

Practicality - Teachers tend to prefer research that is relevant to their current practice, where abstract principles are connected to detailed illustrations and practical examples. In addition,
there is a clear focus on teaching and learning, and the teacher is able to quickly discern how the research informs her/his own work (CUREE, 2003, 2007).

CUREE (2007, p. 16-17) suggests a set of questions to consider in the crafting products, based on their empirical work around the preferences of educators. Several of these questions touch on the importance of practicality.

- Does the product address “what practitioners want to know?”
- Is it evident that the producers of the product searched for “research studies capable of extending and improving existing teaching and learning practices and challenges?”
- Does the product “raise teachers’ awareness of research and its potential uses?”
- Does the product encourage teachers “in interpreting, testing and refining strategies from research in their own context?”
- Does it “provide tools and activities to extend knowledge, skills, and understanding in practitioners’ own contexts?”

Accessibility – Teachers tend to prefer research that is presented in an accessible way, for instance, with the assistance of summary statements, accessible and clear writing, and an organized flow.

Williams and Coles’ study (2003) on the use of research by teachers includes an examination of their current practice, attitudes and skills in relation to research use. The study included surveys of k-12 teachers, principals, advisors, and school librarians in Scotland and England. Results demonstrated that accessibility and time saving were key priorities for teachers in whether to use sources of research information. Participants in the study preferred summary statements, and overviews of the research, “Somebody else can sift through the data, we need the conclusions (p. 24)”; they preferred a format that relied on less formal language; and the physical presentation had an influence, for instance, the preference was for less dense text where information could be scanned and relevant areas found quickly. Williams and Coles pointed to participants’ lack of confidence in interpreting results and evaluating research as a partial explanation.
Appeal – This refers to the overall appearance and appeal of the research. Does it appear professional in format? Is it personalized (educators prefer a report that they can relate to personally in some way)? Would it be fun to read and/or use in practice? (e.g. Davies & Powell, 2012)

Davies & Powell’s article published in the 2012 edition of Evidence and Policy explores how social research findings can be communicated more effectively, drawing from other fields like the arts, literature, and advertising. They find that several forms of presentation may be more accessible and enjoyable to educators, including story-telling as a way to present information in a more compelling and entertaining way, the use of metaphor as generating powerful ways of seeing and being, and advertising/marketing techniques that lay at the heart of influencing how people respond to visuals and language. These elements can personalize the research (stories connecting with people on a social/emotional level that helps them remember the information), and make it more fun and engaging. As they say explain, “Perhaps in our concern to establish rigour in our research, and to differentiate it from other forms of accounts such as journalism, we have stripped out some of the possibilities for persuasive effect (217).”

Credibility – This refers to the producers of the research themselves, the funding behind the research, the affiliated organization, etc. Teachers tend to prefer research from those organizations that they know or have heard of, and research that is referred through informal rather than formal networks. It is also helpful if the researcher or the affiliated organization is recognizable to the educator, in a positive way.

Several studies point to the strong influences of informal networks on an individual's practice (Cordingley, 2008; Nutley et al, 2007; Maynard, 2007). This idea is also present in the diffusion of innovation theory where “opinion leaders” (Kautz & Larsen, 2000) and “change agents” (Coleman Katz & Mendel, 1966) act as effective promoters of an innovation. Coleman, Katz & Menzel’s (1966) study on the diffusion of medical innovations, for instance, demonstrated that the more credible a “change agent” appeared, the more likely the innovation supported would be adopted.
When generating these categories, I found overlaps in the two bodies of literature I drew from on research use and marketing. For instance, a key idea in the research use literature is how educators find people they know, their colleagues and peers, to be more credible than formal networks of people they may not know (Coburn & Talbert, 2006; Daly, 2012; Landry, Amara & Lamari, 2001); likewise, in the marketing literature, establishing a credible brand name and a trusting relationship with the consumer is also considered to be important. This idea fits under the quality I titled ‘credibility.’ In the research use literature, one’s belief systems and personal experiences may have strong influences on research interpretation (Joram, 007); similarly, in the marketing literature, understanding consumers’ needs, values and beliefs is also prevalent. This idea fits under ‘compatibility.’ In the literature on evaluating the quality of research, testimonials from experts and references to different kinds of studies is seen as important (Litman, 2012); similarly, marketing texts will list product attributes such as expert testimonials and technical support. This fits under ‘research quality.’ The marketing ideas can be found across introductory marketing texts such as Perrault, Cannon & McCarthy (2010). As would be expected, there was some degree of judgment made in synthesizing these qualities. It is important to note that, in my review of the literature, I was not able to find studies in education that systematically addressed how each of these qualities compared with one another in order of importance, as I aim to do in this thesis; however, studies will refer to the importance of these qualities in influencing judgments.

These two bodies of literature, as they overlap with each other, also overlap with the ideas presented in the section on the spread and adoption of innovations. Though I did not use this literature directly in the synthesis of these qualities, ideas about the take up or adoption potential of an innovation are similar. For instance, Frank, Zhao and Borman’s (2004) study on the diffusion of computing technology draw attention to social capital and relationships, a significant idea related to ‘credibility’ above, an idea that emphasizes the significance of informal networks of individuals educators know or an organization they are familiar and have experience with, as a more trustworthy source of information, for instance. External pressures, such as political and social pressures, also were important factors in this literature; however these studies often looked at the movement of an innovation over a larger space and time, rather than individuals’ evaluation of a particular innovation. Influences of the social context and larger ideologies are, however, reflected in the various qualities such as compatibility (whether it is consistent with
experience and understanding, which in turn can be influenced by larger ideas of the time and institutional pressures) and credibility (the trust in and influences of social relationships and expectations).

**Conclusion**

I ground this thesis with a number of ideas in mind as I outlined above: a building debate around the approach of entrepreneurship and innovation as a reform strategy in education, at a time when countless innovations are being actively promoted on the Internet and elsewhere, many offered free of charge to teachers (Carrier et al., 2014); the complexity around defining and identifying innovation; and a tension between evidence and experimentation. In the first paper, I examine the selling of the innovations by looking at how these various qualities are used in their promotion. I explore the frequency of use of these qualities across different kinds of media as well as how the qualities are used, and compare them. For instance, I am able to see how research evidence is used in comparison with the other five qualities credibility, compatibility, appeal, accessibility and practicality. In the second paper, I explore how teachers evaluate and interpret the innovations, as guided by these six qualities as well. The teachers are asked to rate the innovations on these qualities and consider their relative importance in informing their judgments. In this way, I continue to touch on the theme of research evidence by looking at how research compares in importance with several of these other kinds of qualities, and how.

The two studies are presented as separate publishable articles following this introduction, and can be read independently. I follow the presentation of the two articles with a brief conclusion summarizing the findings, offering connections between the two and suggested implications for practitioners, schools, and systems.
Article 1: How Popular Education Innovations are Promoted in the Professional, Mass and Social Medias

Abstract
Currently the education industry has seen a large quantity of ideas, practices and products promoted as useful innovations in the form of, for instance, software applications, open source courseware, online learning platforms, and web 2.0 technologies. There is hype around innovation and entrepreneurship and the possibilities novel and disruptive innovations can have on changing education practice and providing more effective learning solutions. The advent of the Internet and social media technologies allow for an abundance of innovation to be promoted and shared with and between educators, and the increasing use of technologies like iPads in the classroom results in the advertisement of innumerable new education applications. For the educator, there is the difficult challenge of knowing how to sift through this material and separate those innovations that may hold value for their classroom situation from those that have gained wide appeal. In this paper I look at how seven innovations have been treated, in their promotion, in the mass, professional and social medias through a content analysis of non-peer reviewed journal articles (education magazines and trade publications), mass media outlet newspapers and online blog posts. I use a set of six qualities generated from the research use and social psychology of persuasion literatures as a guide (compatibility, accessibility, practicality, evidence, credibility, appeal). Across the document types, mentions of appeal and credibility often appeared more frequently than the other qualities. However the frequency of any quality also depended on the innovation type. Forms of evidence used to support the innovation were likely to come less from formal research studies, and more from anecdotal forms of evidence related to personal experiences, general statistics about problems the innovation addresses, and statistics related to use of the innovation. Even without supporting research evidence, many techniques were used to promote the innovation, as seen in the use of the six qualities- quantity of the users, anecdotal examples, benefits offered by the innovation or its practicality, appealing ideas, etc. Examples of the qualities used as well as frequencies of use for each of the innovations and document types are presented.

Keywords: educational innovation; content analysis; media; promotion; marketing
Introduction

Currently the education industry has seen a large quantity of ideas, practices and products promoted as useful innovations in the form of, for instance, software applications, open source courseware, online learning platforms, and web 2.0 technologies. There is hype around innovation and entrepreneurship and the possibilities novel and disruptive innovations can have on changing education practice and providing more effective learning solutions (e.g. see some recent work on education and social entrepreneurship: Childress, 2010; Hess, 2006; Sandler, 2010). This can be seen in such trends as the rise of start up incubators such as Imagine K12 Inc., Kauffman Education Ventures and Gates Start Up Week; on philanthropic initiatives supporting choice and entrepreneurship; and in the never-ending buzz around free and widely promoted innovations such as Edmodo (online learning platform), ClassDojo (behavior management tool), Khan Academy (instructional videos), Epals (global classroom collaboration), Voicethread (student recorded feedback) and countless others. The advent of the Internet and social media technologies allow for an abundance of innovation to be promoted and shared with and between educators, and the increasing use of technologies like iPads in the classroom results in the advertisement of innumerous new education applications. For the educator, there is the difficult challenge of knowing how to sift through this material and separate those innovations that may hold value for their classroom situation from those that have gained wide appeal.

In this paper I explore how seven popular education innovations are promoted in the mass, professional and social medias using a set of six qualities drawn from the research use and social psychology of persuasion literatures (compatibility, accessibility, practicality, evidence, credibility, appeal). The innovations selected in the study were intentionally those that were widespread in either discourse or use, and that were either lacking a research base as newer kinds of things (Khan Academy, iPad in the classroom, Curriki, Edmodo) or had a research base that reported concerns about efficacy in some of the research literature (Brain Based Education, invented spelling, Irlen Method). For the latter, this means that there have been many studies in the literature that report that use of the innovations produces neutral or negative results, and therefore that the innovations do not have a strong research base to support their claims. Extensive research from communication science and social psychology has shown the powerful effects the media can have on the framing of issues and in influencing people’s views and concerns (e.g. Bryant & Oliver, 2008) yet there is less of this kind of empirical work in education.
In this study I ask, how are popular education innovations promoted in the media? And, How is evidence used in this process? Given that these seven innovations are widely used and are currently or have in the past generated large buzz and discussion, by focusing on how the innovations are advocated (as opposed to critiqued or described) I hope to better understand, as facilitated by the media, the factors that contribute to their popularity- Why are these ideas so appealing? How are the ideas talked about? And what is the role of evidence in this process? While teachers may also read content that critiques these kinds of innovations, I choose to focus on the promotion or the selling of these innovations to better understand this hyped conversation across a range of kinds of media. In doing so I draw on the six qualities and examine the quantity and discussion around them as a way to better understand this promotion process.

The Movement of Ideas and the Role of the Mass Media

The question of how ideas flow and are retained in the social awareness has captured the interest of thinkers from a range of fields. A sampling of such theories include: from organizational and social theory, institutionalism which explores why organizational forms tend to look the same over space and time (Dimmagio & Powell, 1983) and the theory of translation that looks at how ideas are interpreted and translated into practices and in turn edited in the process of travel (Czarniawska & Sevon, 1996); from the social psychological literature, the presence of idea habitats, or environmental cues, that assist in the likelihood an idea is to be remembered over time (Berger & Heath, 2005) and the lens of rumours and legends, where stories arise due to the concerns and anxieties of the time as well as the role of ambiguity and information in the process (e.g. Allport & Postman, 1947 as cited in Bangerter & Heath, 2004); and perspectives that compare idea movement metaphorically to natural science phenomena such as complex adaptive systems (e.g. Davis & Sumara, 2009; Lemke & Sabelli, 2008; Mitchell, 2009) and the spread of disease in epidemiology (e.g. Levin, 1998).

Important to consider in the travel of ideas are the characteristics that may allow it to better diffuse and that assist in its take up capacity. Rogers’ (1962) classic work on the diffusion of innovation is often cited and used as a framework for studying the way innovations move and are adopted over time. In the book, Rogers, a sociologist, synthesized 508 diffusion studies and created a theory of innovation adoption, summarized in five stages as knowledge, persuasion, decision, implementation and confirmation. An innovation is more likely to be adopted when it has compatibility (ease of assimilation into an individual’s life), simplicity (ease of use), trialability
(ease at which the innovation can be tried out/experimented with), relative advantage (how improved the innovation is over its predecessor, if there was one), and observability (the extent of visibility of the innovation to others). Many studies in education have applied the lens of diffusion to understand the movement of an innovation over time including Frank, Zhao & Borman’s (2004) study on the diffusion of computer technology, Renzulli & Roccigno’s (2005) examination of charter school policy implementation and Zemsky & Massy’s (2004) exploration of the hype and eventual ‘bust’ of e-learning.

Scholars have also pointed out attributes of ‘resistant’ innovations. Receptive innovations are ones that “do not require consumers to alter existing belief structures, attitudes, traditions or entrenched routines significantly” while resistant ones may require learning “new routines and habits or embracing new traditions and values” (Garcia, Bardhi & Friedrich, 2007: p. 83). The resistant innovation may also lack compatibility with the work environment, culture and practices (“usage barrier”); may be perceived as too risky (“risk barrier”) or its “performance-to-price value” (p. 8) not as strong as comparable products (“value barrier”); and may be tied to a negative product image (“image barrier”) (Ram & Sheth, 1989).

Scott (2003) classifies idea movement theories into four categories of ‘institutional carriers’ that facilitate the travel of ideas. These include symbolic systems (e.g. media and modes of communication), interpretation (the ways ideas are interpreted or decoded by recipients), relational systems (such as interpersonal and social networks, the nature and quality of ties between individuals and organizations), routines (patterns of human behavior) and artifacts (materials that individuals use).

As one such carrier, the media has an important place in facilitating the travel of ideas. The mass media, or various forms of communication targeted to reach a wide audience, in the form of, for instance, print, radio, television and film and the Internet, and various forms of social media, or publicly available user-generated content that often is interactive in nature (blogs, discussion boards, Twitter, etc.) allowing for interaction between those who created the content and consumers of that content (e.g. Anderson, 2007; Kaplan & Haenlein, 2010) permeate our lives. The literature on the forms and effects of the media on public opinion and belief is extensive (e.g. Bryant & Oliver, 2008). The media has been shown to play a significant role in agenda-setting, or the shaping of concerns of the public or peoples’ perceptions about the relative importance of issues (McCombs, 2013); the framing of issues, or how issues are packaged through
the use of “arguments, information, symbols, metaphors and images (Bryan & Oliver, p. 19)” in a way that affects the way people come to understand and react to these issues (e.g. Gamson & Modigliani, 1987; de Vreese, 2005); and in persuasion, or in the shaping what people know or believe (Nelson, Oxley & Clawson, 1997). While the literature on the influence of the mass media on public opinion is bountiful, there is less empirical work in education in this area. Scholarship in education has explored the role of the mass media in the policy generation and implementation process (Stack, 2006; Wallace, 1993; Warmington & Murphy, 2004), the influence of popular media and importance of critical media education for students and educators in schools (e.g. Maness, 2004; Stack & Kelley, 2006), and how to translate research findings into popular media (Woo, 2008). Studies have also examined how to more effectively disseminate or communicate research findings in education (Brooker & Macpherson, 1999; Hemsley-Brown, 2004; Mortimore, 2000); because various kinds of evidence may be used in the promotion and support of innovations (e.g. Anderson & Herr, 2011), I discuss this area in more detail below.

**Conceptual Framework**

Several disciplines including education have examined the ways that research evidence can be more effectively communicated or disseminated to practitioners (e.g. knowledge mobilization, knowledge transfer, knowledge exchange, research utilization, etc) as a way to strengthen connections between research, policy and practice (e.g. Kerner & Hall, 2009; Lavis, Robertson, Woodside, McLeod, & Abelson, 2003; Tseng, 2012). Here, the way research is presented is essential; practitioners need to be able to access, interpret and translate research to fit their circumstances and needs.

The following set of qualities were generated through a careful review of the literature on research use, particularly studies that have looked at teachers’ interpretation of educational research (Borg, 2009; Cordingley, 2008; Joram, 2007; Pajares, 2002; Williams & Coles, 2007) and on their specific preferences, needs and desires around its format of presentation (Blamires, Field & Wilson, 2010; Cordingley, Bell, Evans & Holdich, 2005; CUREE, 2003, 2007; NTRP, 2000); this review was also informed by the social psychology literatures on persuasion and influence (e.g. Cialdini & Trost, 1998; Briggs & Stuart, 2006; Kahneman, 2011). I draw from the research use literature because innovations, as they are promoted in the media, are supported by
various kinds of evidence. Given the increased attention and dialogue around research evidence and its use in policy and practice, in the findings of the paper I emphasize and discuss the quality of ‘evidence’ in relation to the other five in more depth. Below I provide a description of each of the qualities.

*Evidence* - This refers to the teachers’ assessment of the quality of the research supporting the innovation itself. Indicators of quality evidence may influence educators’ judgments, including the presence of citations, testimonials from experts, and references to different kinds of studies, as indicators of the research’s quality (Litman 2012; Reid & Gough, 2000). In this study forms of evidence include, but are not limited to, anecdotal accounts, statistics related to the innovation or use of the innovation, and research studies.

*Compatibility* - Teachers tend to prefer research that is compatible with their prior understanding and experience as an educator. Teachers are less likely to pay attention to evidence in areas where they have deeply held beliefs, particularly if this evidence is not consistent with these prior beliefs and experiences (Borg, 2009; Joram, 2007; Levin, 2004; Honig & Coburn, 2008). In this study compatibility refers to consistency with prior beliefs, experiences and with what peers, colleagues and/or friends believe.

*Practicality* - Educators tend to prefer research that is relevant to their current practice, where abstract principles are connected to detailed illustrations and practical examples (Robinson, Hohepa & Lloyd, 2009). In addition, there is a clear focus on teaching and learning, and the educator is able to quickly discern how the research informs her/his own work (CUREE, 2003, 2007). In this study practicality refers to the feasibility of putting the innovation into practice.

*Accessibility* – Teachers tend to prefer research that is presented in an accessible way, for instance, with the assistance of summary statements, accessible and clear writing, and an organized flow. In this study accessibility refers to features of the innovation that allow it to be more easily implemented and understand, and in different contexts.
**Appeal** – This refers to the overall appearance and appeal of the research. Does it appear professional in format? Is it personalized (educators prefer a report that they can relate to personally in some way)? Would it be fun to read and/or use in practice? (Davies & Powell, 2012) In this study appeal consists of any attractive feature or description about the innovation that may pique one’s interest.

**Credibility** – This refers to the producers of the research themselves, the funding behind the research, the affiliated organization, etc. Teachers tend to prefer research from those organizations that they know or have heard of, and research that is referred through informal rather than formal networks. It is also helpful if the researcher or the affiliated organization is recognizable to the teacher, in a positive way (Cordingley, 2008; Nutley et al., 2007; Maynard, 2007). In this study credibility can refer to credibility of the user-base, the developer/founder, supporters of the innovation, and the brand name.

Because I am interested in the kinds of information used to promote the innovations, that the teachers may or may not value, I use the categories as guides to the content analysis, a process I describe in more detail below in the methods.

The extensive literature on the influence the media has on shaping public opinion and belief suggest that this also plays a role influencing what practitioners believe in education. The research use literature refers to the importance of third party or intermediary organizations (a variety of for and non-profits, government operated bodies and membership organizations) that often translate and communicate research findings and therefore act as bridges between research production and dissemination (Davies & Nutley, 2008; Honig, 2004) Intermediary organizations are important because practitioners often do not first encounter research through peer-reviewed academic journals or research reports (Biddle & Saha, 2002; Cordingley, 2008), but through their informal networks and professional development, the media, and these kinds of intermediary third-party organizations. Professional and mass media, in the form of magazines, trade publications, newspapers and various forms of social media such as blogs, Twitter, discussion boards, etc., are forms of communication used by these intermediaries. The ‘media’ as produced by think tanks, companies, consultants and others (e.g. Levin, 2004) can be considered kinds of intermediaries in themselves. Given the important role these organizations play in practitioners’
lives, in bridging knowledge production and use, it would be important to consider how these organizations promote various kinds of ideas or innovations through the media they produce, particularly in their use of evidence supporting these innovations.

Methods

In this paper I look at how seven innovations have been treated, in their promotion, in the mass, professional and social medias through a content analysis of non-peer reviewed journal articles (education magazines and trade publications), mass media outlet newspapers and online blog posts. The innovations were selected with the intent to find a variety of kinds of ideas, practices, and products referred to as ‘innovations’ that were of relevance and interest to classroom teachers, things that they could readily implement in their classrooms and that also met several criterion for ‘spread’ in either use or discourse (e.g. # of online search hits, presence of Twitter/Facebook page, # of blog posts, etc, mass media outlet publications, etc). A list and description of the seven innovations as well as information about their use and/or media coverage, is provided below:

Curriki- http://www.curriki.org/ Founded in 2006, Curriki offers thousands of free teaching resources (lesson plans, etextbooks, assessment activities, videos, simulations, etc) and curricula (according to its website, over 50,000 resources) across grade levels and subject areas. Teachers can search for resources by topic, grade level, resource type and other categories; its members publicly rate each resource. According to its website, Curriki has been supported by a number of generous donors; has initiated partnerships with Nassau BOCES School District in New York, Eco Charter school in New Jersey, and with educators as part of the “Curriki Summer of Content;” and has over 8.7 million users from 194 countries (http://www.curriki.org/welcome/wp-content/uploads/2013/07/07.03.13-Curriki-At-a-Glance-update.pdf)

Edmodo- https://www.edmodo.com/ Founded in 2008 and with over 33 million users, Edmodo is a site, similar to a Facebook design, that offers collaborative tools for the classroom, including a communication platform, a variety of learning applications to supplement classroom instruction,
and assessment tools such as quizzes and polls. As listed on its website, Edmodo has won several awards from various associations (American Association of School Librarians, Tech and Learning, eSchoolNews, etc) and has been featured in articles in the Huffington Post and Chicago Tribune.

Invented Spelling- [http://www.readingrockets.org/article/267; http://www.greatschools.org/students/academic-skills/384-invented-spelling.gs] Invented spelling is an approach that encourages students to write freely without attention to the spelling of words that might disrupt the flow of writing and expression of ideas.

iPad in the classroom- iPads are featured on Apple’s website as a tool for use in the classroom ([https://www.apple.com/education/ipad/teaching-with-ipad/]). iPads offer over 65,000 applications targeted towards teaching and learning, including a variety of multimedia, note taking, presentation, assessment and many other tools. Apple’s website also offers various resource guides for using the iPad, including the use of applications, iTunes university, iBooks, and on “exploring education content for iPad.” ([https://www.apple.com/education/ipad/resources/])

Irlen Method- [http://irlen.com/] Founded in 1983 and with over 170 clinics, the Irlen Institute is an organization that provides ‘Irlen filters’ or colored overlays and lenses to address Irlen Syndrome, a perceptual processing disorder. The company offers diagnostic services and addresses a range of issues including reading problems, headaches, ADHD, autism, brain injury, low motivation and medical conditions. According to its website, Irlen spectral filters are “individual, precision-tinted lenses that filter out the offensive wavelengths of light, allowing the brain to process visual information correctly” where the filter color is determined by a patented testing process to address the specific issue. As quoted on its website, “The Irlen Method has received international acclaim and is included in professional journals and textbooks. It has also been featured in national and international media, including National Geographic, 60 Minutes, Good Morning America, ABC World News, NBC News, the BBC and TV shows in Ireland, Hong Kong, Netherlands, New Zealand, South Korea, and Australia” ([http://irlen.com/media/]).
Khan Academy- https://www.khanacademy.org/ Funded by the Gates Foundation, presented on the television show 60 minutes, tweeted over 28,000 times (as of June 2012), and with millions of independent users (as reported on its website), the Khan Academy is a non-profit organization that offers brief video lesson clips with simple visuals online free of charge, in several languages, across a range of subject areas including math, science, economics and the humanities. The organization is often associated with the ‘flipping the classroom’ approach where students watch videos or instructional materials as a form of self-instruction; in class time is spent on reviewing problems and discussing questions and ideas.

Founded in 1994, Jensen Learning offers workshops, products (dvds, books, videos, etc), and certifications, that are based on the brain based approach, one that supports the use of strategies based on what is known about how the brain functions optimally. Its website includes a list of schools where teachers are implementing brain based approaches (http://www.jensenlearning.com/schools.php).

I choose the professional and mass media in education because the documents provided by these sources tend to be communicated for a larger audience of practitioners, community stakeholders and others, and often presented in a more accessible format than research articles or reports targeted towards an academic audience. These forms of media also consist of a wide range of authors (practitioners, freelancers, consultants, community stakeholders, etc) and therefore may reflect a wider range of perspectives. The material is often shorter and glossier, written to educate, persuade and possibly entertain, with no peer review checks. The material therefore may be more reflective of the popular discourse, unfiltered, about the respective innovation in the larger education community.

Search and Selection of the Documents

In order to identify the documents to be reviewed, I use several comprehensive education and newspaper archive databases and Google. The education databases I searched included CBCA Education, Proquest Education Journals and ERIC. ERIC (coverage from 1966 and updated monthly), or the Education Resource Information Centre, “provides coverage of journal
articles, conferences, meetings, government documents, theses, dissertations, reports, audiovisual media, bibliographies, directories, books and monographs”
(http://www.csa.com/factsheets/eric-set-c.php) and is a frequent source for education researchers. Proquest Education Journals (coverage from 1991) includes access to 1020 popular education publishers and, as with ERIC, provides content at all levels of schooling and in a range of subject areas (http://www.proquest.com/products-services/pq_ed_journals.html). CBCA education (coverage from 1977) focuses on Canadian content, with over “150 Canadian education periodicals plus education articles in over 700 Canadian journals and newspapers” (http://www.library.ualberta.ca/databases/databaseinfo/index.cfm?ID=135). I searched for the innovation name in all 3 databases simultaneously and ‘anywhere’ (as opposed to narrowing by title, for instance) in order to locate all articles that mentioned the innovation. I filtered the results to trade publications and magazines (as non-peer reviewed forms of professional media) and recorded the search string and number of hits for each search. I used Proquest Newsstand to search for mass media newspaper publications. Proquest Newsstand contains extensive coverage of major national and international newspaper titles (e.g. NY Times, Washington Post, Guardian, Globe and Mail, Toronto Star, etc) and “offers one of the largest collections of local and regional newspapers available” (http://www.proquest.com/products-services/newsstand.html). For these databases, I also searched for the innovation name ‘anywhere’ in order to ensure I identified all documents that spoke about or mentioned the innovation.

A third search process used Google. I chose blogs as one example of social media in order to see how a lay audience discussed the innovations and in order to understand the nature of this discussion. All sorts of people from the general public write blogs (community stakeholders, students, parents, teachers, researchers); as a form of unfiltered, user-generated content, these individuals may share their perspectives about the innovations more openly than in published content. I chose blogs as opposed to other forms of social media like Twitter, Facebook posts, and discussion boards because blogs may provide more text generated by one individual for analysis. In addition, while there are many forms of social media (discussion boards, video blogs, wikis, chat rooms, social networking websites and others e.g. Parsons, 2013), blogs often do not involve interactive dialogue, as do these other forms. Similar to trade journals/magazines, this form of
social media provides written text by a single individual that is non-peer reviewed. For the search process I searched for the innovation name + blog.

Table 3 below records my search process (the strings I used and number of hits, by search engine) for each of the seven innovations.

Table 3: Media Search- Search Strings and Hits by Innovation

<table>
<thead>
<tr>
<th>Innovation</th>
<th>Search Engine</th>
<th>Search String</th>
<th># of Hits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain Based Education</td>
<td>CBCA Education, Proquest Education Journals, ERIC</td>
<td>brain based education and Jensen searched anywhere</td>
<td>Trade Journals- 127 Magazines- 21</td>
</tr>
<tr>
<td></td>
<td>Google</td>
<td>brain based education + jensen + blog</td>
<td>81,600 (344 results non-repetitive)</td>
</tr>
<tr>
<td></td>
<td>Proquest Newsstand</td>
<td>brain based education and Jensen searched anywhere</td>
<td>Newspapers- 380</td>
</tr>
<tr>
<td>Curriki</td>
<td>CBCA Education, Proquest Education Journals, ERIC</td>
<td>Curriki searched anywhere</td>
<td>Trade Journals- 37 Magazines-6</td>
</tr>
<tr>
<td></td>
<td>Google</td>
<td>Curriki + blog</td>
<td>89,800 (128 results non-repetitive)</td>
</tr>
<tr>
<td></td>
<td>Proquest Newsstand</td>
<td>Curriki searched anywhere</td>
<td>Newspapers- 56</td>
</tr>
<tr>
<td></td>
<td>Google</td>
<td>Edmodo + blog</td>
<td>2,130,000 (256 results non-repetitive)</td>
</tr>
<tr>
<td>Invented Spelling</td>
<td>Proquest Newsstand</td>
<td>Edmodo searched anywhere</td>
<td>Newspapers- 186</td>
</tr>
<tr>
<td></td>
<td>CBCA Education, Proquest Education Journals, ERIC</td>
<td>“invented spelling” searched anywhere</td>
<td>Trade Journals- 117 Magazines-16</td>
</tr>
<tr>
<td></td>
<td>Google</td>
<td>&quot;invented spelling&quot; + blog</td>
<td>41,500 (371 results non-repetitive)</td>
</tr>
<tr>
<td></td>
<td>Proquest Newsstand</td>
<td>“invented spelling” searched anywhere</td>
<td>Newspapers- 324</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(only 1 matched criteria)</td>
<td></td>
</tr>
</tbody>
</table>
I selected documents at random in order to ensure a breadth of selection from the search results. 3 trade publications or magazines (from the three education search databases), 3 newspaper articles (from Proquest Newsstand) and 3 blogs (from Google) for each of the 7 innovations were selected for a total of 63 documents. In this paper I explored only those documents that promoted the innovation; therefore, I filtered my results following two criteria below, continuing to randomly select until I identified ones that matched these criteria.

-Document that specifically focuses on discussing the innovation or the idea behind the innovation (as opposed to a passing mention, for instance)
-Document that promotes the innovation (may critique it but takes a persuasive stance advocating its use)

The randomly selected trade journals and magazines that met these criteria were saved in folders; blog posts and newspaper articles were copied and pasted into word documents. I was able to identify documents for each of the seven innovations and across document types with the exception of Irlen Method, where, for the category trade journals/magazines, I was only able to...
identify two trade journals/magazines in full text that met the criteria. In this case, I conducted an additional search for the third trade journal/magazine using the “Proquest Social Science Journals” database, which includes a wider breadth of journals outside of education but specific to the social sciences.

Analysis

I analyzed the documents using a content analysis process and the six qualities as a guide (compatibility, accessibility, practicality, evidence, credibility, appeal). An excel document was created to organize the findings; the seven innovations were listed in the left hand column and the six qualities along with a heading for ‘critiques’ along the top row. I also recorded the approximate length of each document (ranging from ½ to 5 pages) along with the document type (blog, magazine/trade journal or newspaper) and reference. As would be expected, a range of individuals including researchers, consultants, professors, school practitioners, community stakeholders, and others wrote the documents. A full reference list of the documents that were analyzed appears in Appendix A.

I began my content analysis process by reading through each document; for every example within the document that was given that fit one of the six qualities, I recorded a bullet summarizing that example, using the language from within the document. For instance, for the following sentence “The potential impact of a large, free, and open repository of high-quality resources and tools to collaborate on content development is seismic (Levy, 2009, p. 11)” I recorded as a summary bullet *large, free, open repository of high quality resources; seismic potential* under the column “appeal.” As described in the literature review, appeal consists of any attractive feature or description about the innovation that may pique one’s interest. In the case that multiple examples were included in a single sentence, this was counted as one bullet, or one example of that quality. Examples (for instance, detailed examples of a teacher using the innovation) that extended beyond a sentence were also recorded as single bullets. By creating summary bullets, I was able to keep track of the kinds of examples given in the text as well as quantity (by counting the number bullets). Often ideas in the documents were overlapping or were described more than one time, in different ways and in different places in the documents. For consistent analysis across the documents and in order to ensure I recorded the quantity of times a quality was used, I recorded these examples as separate summary bullets. In addition, some overlap between the qualities was expected. For instance, a description of a practical
feature of an innovation might also be considered to fit the quality “appeal.” In order to ensure that each quality was distinct, for descriptions that emphasized practicality or accessibility, these bullets were listed under these respective headings and not under the quality “appeal.” Likewise, a quote from a credible source could be considered an example of the quality “credibility” but also “appeal” if the quote was about why the innovation was appealing. In this case, I recorded the source of the quote as an example of credibility with the content of the quote under appeal (or whatever respective category it fell under). I used the descriptions provided in the literature review of the qualities as a guide.

After completing this process and when analyzing the results, I counted the number of bullets (Table 2 below) across the qualities and by innovation in order to understand the frequencies of the qualities across the documents and by innovation, in relation to one another. I then read through the bullets and searched for patterns and themes across them, synthesizing them into a set of categories, each representing different kinds of qualities (Table 3 below). I then counted the quantity of these bullets across the innovations in order to see how the qualities were used across the documents.

The intent of this process was to understand the quantity of each quality in relation to one another, in support of the innovation, and the ways these qualities were used. Some questions in mind included, what kinds of evidence are presented across the documents (anecdotal, peer reviewed research, etc)? What qualities seemed to be mentioned more frequently? How are the qualities used? In the findings I also include qualitative illustrations of how they qualities are used within the different document types.

**Findings**

*Frequency of Qualities by Innovation and Document Type*

Table 4 below records the number of times each quality was mentioned by document type and innovation and in total across all the documents/innovations. The quality “appeal” appeared most frequently for 4 of the 6 innovations (with the exception of Irlen Method where evidence/credibility and Edmodo where practicality appeared more frequently), as well as in total across all the documents/innovations. Appeal was mentioned 396 times across the 63 documents, a number that was more than double the second most-often appeared quality credibility (183) and much greater than as found in the other qualities at 124 for evidence, 96 for
practicality, 50 for accessibility, and 27 for compatibility. Credibility was the second most frequent quality across the innovations, at 183 across all documents, and appearing second most frequently behind appeal for 3 of the 6 innovations. The number of critiques that were mentioned about the innovations overall, or 60, appeared less frequently than 4 of the 6 other qualities, behind appeal, credibility, evidence and practicality. Compatibility appeared least frequently across the innovations and across all the documents as a whole, suggesting that the various medias promoting the innovations rely less on relating the innovation to the readers' prior experiences/knowledge than on emphasizing other qualities related to, for instance, the credibility and appeal of the innovation.

Upon closer review, the results show that the frequency of the qualities may relate in part to the type of innovation. For instance, the documents in Edmodo emphasized practicality, while the documents in Irlen Method stressed evidence and credibility and where appeal dominated in Invented Spelling. This may relate to the format of the innovation and its associated idea; Edmodo, a software program similar to a Facebook design used for cross collaboration, has a number of design features that assist in its practical use; these features may therefore be described/emphasized at a greater rate than other qualities like evidence, appeal and credibility, as compared with the other innovations. As one example, the newspaper article Social network for teachers, students a hit emphasizes practical functions such as “secure groups” where students and teachers could “upload course content, homework, polls and quizzes as well as moderate discussions” and with various other examples given of Edmodo’s practical use (Zhaowei, 2012).

Irlen method is an idea that may not be as intuitive or inherently appealing as the others; hence a reasonable strategy would be to focus on credibility and evidence, as is demonstrated by the frequency of these qualities. Rontree-Carey (2013) in his article on coloured overlays, for instance, gives quotes (a form of credibility) to counter studies that have results that show a negative or neutral outcome of lenses e.g. as one special education expert is quoted, “the lack of take-up of coloured overlays is one of many areas where schools are failing special educational needs students” and another educational needs coordinator quoted as, “I’ve supported the use of overlays for several years for any child who reported that for them letter and words moved around a page. It’s a very small expense” (Rontree-Carey, 2013, p. 40). For the innovation invented spelling, appeal greatly exceeded the other qualities at 47 mentions, where the next often cited quality was evidence at 13; this may relate to the idea behind invented spelling and its
inherent appeal, for instance, in encouraging students to write without interruption and with freedom of expression. This can be seen in countless examples, e.g. a blog that quotes a teacher suggesting that children should “write freely without interruption to their thoughts” (Leach, 2012, para. 5); Gottesman’s (1993) newspaper article where “it is important not to stifle kids;” (Gottesman, 1993, p. 14b) and another blog where first drawings are described as a sign of “intelligence” and “emergent proficiency” for most people, an analogy to invented spelling (Webjen, 2010, para. 6).

When examining the frequency of the qualities by document type and across the 63 documents, all the qualities appear more times for trade journals/magazines and newspapers than blogs, suggesting that blogs are supported with less descriptions of these qualities than are used by these other medias as a whole and with a reliance on “appeal” over the other qualities. Appeal appeared most frequently for each document as a whole, with trade journals/magazines at 159, newspapers at 119 and blogs at 118 mentions. Trade journals/magazines and newspapers also emphasized credibility at 66 and 82, respectively. Evidence appeared more frequently for trade journals/magazines than for newspapers at 57 compared with 41.
Table 4: Frequency of Quality by Innovation and Document Type

<table>
<thead>
<tr>
<th>Innovation</th>
<th>Document Type</th>
<th>Qualities</th>
<th>Compatibility</th>
<th>Credibility</th>
<th>Evidence</th>
<th>Practicality</th>
<th>Accessibility</th>
<th>Appeal</th>
<th>Critiques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain Based Education</td>
<td>TJ/Magazines</td>
<td>1</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>0</td>
<td>32</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Blogs</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Newspapers</td>
<td>1</td>
<td>14</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>3</strong></td>
<td><strong>29</strong></td>
<td><strong>18</strong></td>
<td><strong>13</strong></td>
<td><strong>0</strong></td>
<td><strong>59</strong></td>
<td><strong>2</strong></td>
<td><strong>0</strong></td>
</tr>
<tr>
<td>Curriki</td>
<td>TJ/Magazines</td>
<td>3</td>
<td>17</td>
<td>13</td>
<td>5</td>
<td>8</td>
<td>32</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Blogs</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>20</td>
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<td>0</td>
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<tr>
<td></td>
<td>Newspapers</td>
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<td>1</td>
<td>2</td>
<td>16</td>
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<td>0</td>
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<td><strong>Total</strong></td>
<td></td>
<td><strong>5</strong></td>
<td><strong>33</strong></td>
<td><strong>23</strong></td>
<td><strong>7</strong></td>
<td><strong>15</strong></td>
<td><strong>68</strong></td>
<td><strong>12</strong></td>
<td><strong>1</strong></td>
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<td>Edmodo</td>
<td>TJ/Magazines</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>22</td>
<td>6</td>
<td>22</td>
<td>1</td>
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<tr>
<td></td>
<td>Blogs</td>
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<td>12</td>
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<td>20</td>
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<td>11</td>
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<tr>
<td></td>
<td>Newspapers</td>
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<td>12</td>
<td>5</td>
<td>12</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>4</strong></td>
<td><strong>30</strong></td>
<td><strong>12</strong></td>
<td><strong>54</strong></td>
<td><strong>9</strong></td>
<td><strong>44</strong></td>
<td><strong>1</strong></td>
<td><strong>1</strong></td>
</tr>
<tr>
<td>Invented Spelling</td>
<td>TJ/Magazines</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>4</td>
<td>0</td>
<td>12</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Blogs</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>23</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Newspapers</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>4</strong></td>
<td><strong>7</strong></td>
<td><strong>13</strong></td>
<td><strong>5</strong></td>
<td><strong>0</strong></td>
<td><strong>47</strong></td>
<td><strong>4</strong></td>
<td><strong>2</strong></td>
</tr>
<tr>
<td>Irlen Method</td>
<td>TJ/Magazines</td>
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<td>11</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Blogs</td>
<td>0</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Newspapers</td>
<td>1</td>
<td>7</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>2</strong></td>
<td><strong>23</strong></td>
<td><strong>24</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
<td><strong>19</strong></td>
<td><strong>13</strong></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td>iPad in the classroom</td>
<td>TJ/Magazines</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>26</td>
<td>5</td>
<td>5</td>
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<tr>
<td></td>
<td>Blogs</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>6</td>
<td>12</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Newspapers</td>
<td>2</td>
<td>15</td>
<td>1</td>
<td>11</td>
<td>10</td>
<td>26</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>4</strong></td>
<td><strong>25</strong></td>
<td><strong>6</strong></td>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
<td><strong>64</strong></td>
<td><strong>13</strong></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td>Khan Academy</td>
<td>TJ/Magazines</td>
<td>1</td>
<td>14</td>
<td>9</td>
<td>0</td>
<td>1</td>
<td>27</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Blogs</td>
<td>1</td>
<td>7</td>
<td>8</td>
<td>0</td>
<td>3</td>
<td>31</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Newspapers</td>
<td>3</td>
<td>15</td>
<td>11</td>
<td>0</td>
<td>5</td>
<td>37</td>
<td>6</td>
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<td><strong>Total</strong></td>
<td></td>
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<td><strong>36</strong></td>
<td><strong>28</strong></td>
<td><strong>0</strong></td>
<td><strong>9</strong></td>
<td><strong>95</strong></td>
<td><strong>15</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>All Innovations</td>
<td>TJ/Magazines</td>
<td>11</td>
<td>66</td>
<td>57</td>
<td>48</td>
<td>16</td>
<td>159</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Blogs</td>
<td>5</td>
<td>35</td>
<td>26</td>
<td>24</td>
<td>16</td>
<td>118</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Newspapers</td>
<td>11</td>
<td>82</td>
<td>41</td>
<td>24</td>
<td>18</td>
<td>119</td>
<td>17</td>
<td>17</td>
</tr>
</tbody>
</table>
Overall, the results in table 4 show that appeal was the overwhelming emphasis across the document types and credibility the next most-often. However, the emphasis of the quality also depended on the innovation type and its associated idea; this means that while one might expect to find a lot of mentions of appeal and credibility in documents promoting innovations and fewer mentions of evidence and the other qualities, this will also likely vary by kind of innovation. In addition, in online blogs there will be fewer mentions of all the qualities suggesting that one could expect blogs overall to be less developed and supported by number of mentions of the various qualities than the other document forms. However, as the frequency of the quality may vary by innovation type, this may also relate to the document form; while all documents emphasized appeal, trade journals/magazines and newspapers emphasized credibility more heavily than blogs and evidence appeared most frequently for trade journals/magazines.

The methodology in this approach is limited and serves as a proxy for the kinds of qualities emphasized by document type and innovation one might expect to find. For instance, because the documents ranged in length from ½ to 5 pages, it is possible that there would be a higher frequency of the qualities in some of the lengthier documents. In addition, examples of qualities can vary in length description, some appearing as brief as a few phrases while others lengthening into several sentences or whole paragraphs for a single example. A lengthy example of a school using the innovation would count as one example of credibility, while a short sentence using hyped language describing the innovation would count as an example of appeal. In this process, I made an effort to check these limitations by ensuring I kept track of page number length of the various documents as well as carefully coding each quality mentioned. While length considerations certainly influence frequency, it is possible to see patterns in frequencies of the qualities used across a larger number of documents.

**Kinds of Qualities across the Documents**

Table 5 below synthesizes different categories or kinds of qualities that were used across the 63 documents, including the number/percentage of documents that used each. I ordered these categories as they were used most often by the documents, by quality. Beside each kind of quality I include examples from the documents to illustrate, with an effort to include examples
from a range of the documents/innovations. Most notably and as might be expected all 63
documents mentioned benefits of the innovation, under the quality ‘appeal.’ 54 or 86% of the
documents used charged or descriptive language. For instance, Axelson (2007) described Curriki
as a “hot new website” and “captivating” and for Levy (2009) “true, disruptive change;” for
Peace Through Language Club, Edmodo is “Education 24/7” (Peace Through Language Club,
2012) and Wilson (2012) highlights Edmodo as a “big hit;” Sterling (2012) describes how the
brain based approach offers “new insights” and Powell (2010) as “enriching” the experiences of
students. This charged and descriptive language was, as might be expected, a common trait
across all documents. A wide range of kinds of ‘credibility’ were used by the documents, ranging
from the most often used form of credibility, mentioning other school
systems/individuals/organizations using it or implementing a similar approach, by 39 or 62% of
the documents, and describing experiences with use of the innovation, by 38 or 60% of the
documents. For instance in his article promoting open source curricula, Sapers (2013) gives
several brief examples of schools using tools such as iPads and Discovery’s digital textbook
(“techbook”) series and a school assembling open source curricula such as CK-12, OER
Commons and Saylor.org (p. 31). Other kinds of credibility included quoting credible sources,
used by 20 or 32% of the documents and partnerships (16 or 25%), expert reviewers (8 or 13%),
and funding/awards (7 or 11%). For example, Kurshan (2007) in an article on Curriki cites how
resources posted on the website are reviewed by ‘content experts;’ how the innovation has been
tested at a conference called Poptech; and how other organizations are using open source
courseware such as the Texas school system and the California State University system through
an open source program called Merlot (http://www.merlot.org/merlot/index.htm). Kurshan
also describes how publishers are also moving towards open source curricula. Chandler (2012) in
a newspaper article uses a range of forms of credibility, for instance, citing Curriki’s number of
members (250,000); discussing how states have invested in online textbooks where California,
Utah and Virginia initiating open source programs; citing credible and high profile individuals
such as the US Secretary of Education who described Curriki as having “tremendous educational
promise” and the chief executive of Pearson, a textbook publishing company who stated how the
“traditional textbook is dying”; giving examples of funding sources such as Federal Race to the
Top Funds and foundations who invested in free instructional materials; and providing examples

1 References for the documents appear in Appendix A
of other similar programs such as the OER Commons (https://www.oercommons.org/) which, in addition to resources, provides tools to measure how aligned resources are to state standards (Chandler, 2012). Other articles may rely on personal experience descriptions and quotes such as Wilson (2012) in a newspaper article on Edmodo who gives brief descriptive examples from a school technology specialist, a 6th grade language arts teacher and two students using the innovation. One of the students found it useful for homework and another convenient because the student did not have to bring assignments home. Chernos (2003) in an article on Irlen Method gives descriptive examples from a parent, student, two principals and a special education consultant. Other examples include lengthy descriptions of schools, organizations or others using the innovation, Dry Creek elementary (Caine & Caine, 1995) that piloted the innovation Brain Based Education where the authors described results such as improved parent-staff interaction, an increase in staff enthusiasm, and a re-designed classroom. Prominent organizations might experiment with and be using the innovation and cited briefly as examples as well such as Apple’s iPad Learning Lab (Educators find the iPad a useful aid in the classroom, 2011) and Stanford, University of Michigan and University of Pennsylvania partnering with Coursera (Khan academy: A free tutorial home for learners, 2011). Awards might also be used as a form of credibility e.g. Khan Academy’s Microsoft Tech award in education (Cardoso, n.d.). As with credibility, a wide range of forms of evidence were used with the most often form including describing experiences relating to use of the innovation (22 or 35%) and statistics related to the problem the innovation addresses (21 or 33%). For instance, Kurshan (2007) in an article on Curriki cites how 18 states are introducing legislation on textbook costs and Sapers (2013) in relation to Khan describes how the organization Discovery has more than 650000 students in 42 states accessing its company’s techbook series, a digital textbook and PBS learning media with more than 20000 registered users and over 6000 registered teachers. A description related to the use of the innovation and its results, as described in the literature review, I considered as anecdotal forms of evidence. Gallagher (2012) in a blog post describes the experience of the Los Altos school district piloting Khan Academy where they found the best value lay not in the videos but the data generated in the exercise modules. Chernos (2003) provides a personal example from a student who had headaches due to lines moving when reading and where the Irlen lenses resulted in “remarkable progress.” (Chernos, 2003). Citing other research studies related to the innovation and its effectiveness appeared as the least often used form of evidence, and was described by only 8 or
13% of the documents, suggested anecdotal forms of evidence and kinds of credibility and appeal were used by many more of the documents than evidence as presented in formal research studies testing the innovation’s effectiveness. For example, Chandler (2012) on Curriki cites a survey by Simba information where “74% of elementary school teachers reported that they used free Internet resources for lessons on white boards or other gadgets compared with 65% who said their digital content came from commercial provider” (p. B1); Danaher (2010) on the Irlen Method describes how some of the students at Ennis National School improved reading rates by 20% through use of Irlen filters; and Siegle 2014 on flipped classroom technology cited research from the Flipped Learning Network where “a teacher survey of the impact of flipping the classroom found that teachers reported 80% of their students had improved attitudes toward school (p. 52).” Findings from studies might also be cited more generally, for example as Gottesman (1993) states, “most often cited short term studies found that invented spellers wrote significantly longer compositions than traditional spellers (p. 14b).” However, aside from piloted examples, none of the documents described or explored research studies testing the effectiveness of the innovation, in depth, with detailed descriptions about methods or findings.
Table 5: Examples of Qualities Across the Documents

<table>
<thead>
<tr>
<th>Quality</th>
<th>Kinds</th>
<th>Examples</th>
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</table>
| Compatibility | • Relating the innovation or the problem it addresses to a personal experience (15 or 24%)  
                     • Comparing the innovation to another similar innovation the reader has likely used (5 or 8%)  
                     • Statements about the general population (4 or 6%) | • Curriki: College textbooks as a “scam” (“Scott McNealy’s Curriki”, 2010, para. 3)  
                                                                                       • Invented Spelling: a child’s first drawing as a “display of intelligence and emerging proficiency” (Webjen, 2010, para. 6)  
                                                                                       • iPad in the classroom: “Just carry an iPad into a restaurant or a school library and see how much attention you get!” (Foote, 2010, p. 17)  
                                                                                       • Curriki: EduTube (Axelson, 2007) and Wikipedia (Kurshan, 2007)  
                                                                                       • Brain Based Education: “Most teachers have a mental model of teacher roles and learning- deeply held assumptions that are, we believe, physiologically entrenched as a result of early experiences in school.” (Caine & Caine, 1995, p. 44) |
| Credibility  | • Mentioning other school systems/individuals/organizations using it or implementing a similar approach (39 or 62%)  
                     • Describing the experiences of others (teachers, students, principals, | • iPad in the classroom: Cited several principals, superintendents, districts, and teachers using iPads (“Collaboration is key to iPad implementation”, 2012)  
                                                                                       • Brain Based Education: Extended example of applying brain based |
districts, etc) and/or personal examples of using the innovation (38 or 60%)

- Quoting credible sources (professors, industry experts, etc) (20 or 32%)

- Partnership with another organization, researchers, company, etc. (16 or 25%)

- Tested at a conference, school, district or other setting (9 or 14%)

- Experts who review or assist with the innovation (8 or 13%)

- Funding and awards from well-known organizations and individuals (7 or 11%)

- Practices at Dry Creek school resulting in improved staff interaction and enthusiasm (Caine & Caine, 1995)

- Irlen Method: Teachers in school south of England using rainbow overlays (Matt, 2013)

- Khan Academy: Bill Gates quoting the innovation as “remarkable”; Executive director of Education Week Digital Directions quoted “Khan’s timing is perfect, because students and parents are living in the age of YouTube, where video watching is routine.” (della Cava, 2012, p. D1)

- Curriki: partnering with the American Association of Retired professionals where retired teachers create materials on the Web site (Axelson, 2007)

- Khan Academy: Partnership with Los Altos School District to test; study by SRI international “to help determine effectiveness of the implementation model” (para. 10) (Gallagher, 2012)

- Curriki: contributors are educators, organizations and states; “subject matter experts” and “master teachers” review the resources (Levy, 2009, p. 11)

- Brain Based Education: the authors partnered with neuroscientists who led an approach to studying the brain (Nunley, 2002)

- Khan Academy: Google awarded Khan $2 million & Khan received Microsoft Tech Award (“Khan Academy”, 2011); Silicon valley philanthropist provided funding (della Cava, 2012)
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<th>Evidence</th>
<th>• Describing experiences related to use of the innovation (22 or 35%)</th>
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<td></td>
<td>• Statistics related to the problem the innovation addresses and use of the innovation (21 or 33%)</td>
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<tr>
<td></td>
<td>• Quantity and kinds of users of the innovation (13 or 21%)</td>
</tr>
<tr>
<td></td>
<td>• General research statements about related problems the innovation addresses (12 or 19%)</td>
</tr>
<tr>
<td></td>
<td>• Brain Based Education: Example of a school using a snake, music and florescent lighting (Ellerton, 1998)</td>
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<tr>
<td></td>
<td>• Irlen Method: Through the use of overlays, the author felt reduced stress and less tense while driving (Kendrick, 2014)</td>
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<td></td>
<td>• Curriki: “With 3.1 million teachers in the U.S. spending an average of $4,500 per year, the total expenditure on instructional materials is roughly $14 billion.” (National Center for Education Statistics as cited in Levin, 2009, p. 12)</td>
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<td></td>
<td>• Irlen Method: “The Irlen Institute estimates that 10 to 12 percent of children and adults have some degree of scotopic sensitivity” (Chernos, 2003)</td>
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<td>• Khan Academy: “more than 650,000 students in 42 states have access to the company’s Techbook series, a digital textbook solution for k-12 students”; “PBS learning media, which says it added more than 200,000 registered users in September and had a 400 percent uptick in usage of its site compared with last year” (Sapers, 2013, p. 30)</td>
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<td></td>
<td>• Edmodo: ten million Edmodo users; Used by 100,000 school and 12,000 school districts (Holzweiss, 2013, p. 14)</td>
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<td></td>
<td>• Invented Spelling: “The most oft-cited short-term studies found that invented spellers wrote significantly longer compositions than traditional spellers” (Gottesman, 1993, p. 14B)</td>
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| | • Irlen Method: “Globally, surveys have shown Irlen Syndrome can affect one in eight of the general population and nearly half of those
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<tr>
<th>Practicality</th>
<th>Features of the innovation that allow for easier use (20 or 32%)</th>
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- Piloting/testing the innovation and reporting the results (9 or 14%)
- Citing other research studies (or lack of) related to the effectiveness of the innovation (8 or 13%)
- Practicality

- Features of the innovation that allow for easier use (20 or 32%)
- Curriki: Easy to adapt and edit content to meet classroom needs (p. 10); “advanced search feature” that allows teachers to review content with ratings as a guide (p. 11); “Comment tab, where members can share how they implemented a unit, how effective it was, and what they might do differently next time” (p. 11) (Levin, 2009)
- Edmodo: “cloud-based tools”, “virtual conference room”, “collaborate and connect with teachers from around the world”, “… websites, polls, delicious stacks, vokis, prezis, glogs, SchoolTube videos and an exit survey” (Peace through Language Club, 2012, para. 7)

- Khan Academy: “A teacher survey of the impact of flipping the classroom found that teachers reported 80% of their students had improved attitudes toward school” (Flipped Learning Network, 2012 as cited in Siegle, 2014, p. 52)
- iPad in the classroom: “Studies have shown iPads facilitate student engagement and help students improve skills” (Friedlander, n.d., para. 1)

- Irlen Method: 360 students at a school attended screening with many diagnosed—after the overlays, reading race rates improved 20% (Danaher, 2010)
- Edmodo: “On an exit survey for Exploratory Language, one out of every three seventh graders answered that Edmodo was among the best tools we used during the year for language learning” (Peace through Language Club, 2012, para. 7)

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<th>Accessibility</th>
<th>Appeal</th>
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<tr>
<td>• Customizable/adaptable, addressing different needs (7 or 11%)</td>
<td>• Curriki: “access to quality curricula” (p. 29); “opportunity for urban schools” (p. 29); “global population” can access and customize (p. 29); “easily reach a population that was previously inaccessible” (p. 29); free resources (p. 30); “widely available educational content” (p. 32) (Kurshan, 2007)</td>
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<td>• iPad in the classroom: “…using technology, easily adapted and manipulated to fit different students’ needs, was a useful practice” (“Teachers in iPad equipped classrooms”, 2013, p. 8)</td>
<td>• iPad in the classroom: “smaller, slimmer, lighter, more portable counterparts - tablets” (“Teachers in iPad equipped classrooms”, 2013, p. 8)</td>
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<tr>
<td>• Edmodo: “offers several tools for teachers to customize their own personal learning network” (Dobler, 2012, p. 13)</td>
<td>• Khan Academy: “Accessible, portable, shareable, trackable, scalable, and best of all, free” (Cardoso, n.d.)</td>
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<tr>
<td>• Able to be accessed by larger populations (distance, income, etc) (14 or 22%)</td>
<td>• Benefits offered by the innovation (63 or 100%)</td>
</tr>
<tr>
<td>• Features of the innovation or its design that make it accessible (12 or 19%)</td>
<td>• Curriki: solution to ease textbook cost (p. 29); allows for collaboration (p. 30) (Kurshan, 2007)</td>
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| • Invented Spelling: “encourages children to get their ideas down on paper”; “has a positive impact on reading”; “lets teachers adjust instruction to what students need to
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<th>Using charged and descriptive language (54 or 86%)</th>
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<tr>
<td>Clearly identifying a problem the innovation solves or a need it addresses (19 or 30%)</td>
</tr>
<tr>
<td>Possibility or potential of the innovation (30 or 54%)</td>
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| Curriki: “hot education Web site”; “captivates teachers, parents and students”; “high-quality content” (Axelson, 2007, p. 19) |
| Brain Based Education: “authentic assessment of all types” (p. 45); “dynamic way of approaching teaching” (p. 43); “holistic approach” (p. 44) (Caine & Caine, 2005) |
| Irlen Method: “fashion student attitude”; quotes a principal describing overlays as “prescribed optimism” and “viewing life through rose-coloured glasses” (Chernos, 2003) |
| Khan Academy: “Impressive”; “humanizing the teacher to student classroom experience”; “revolutionize the way your child will learn” (Cardoso, n.d.) |
| Curriki: “global vision”; “equality of education opportunity”; “growth potential is huge”; “promotes cutting edge practice” (Haigh, 2007, p. 4) |
| Khan Academy: Bill Gates quoted “profundely positive difference in education”; popular; Silicon Valley philanthropist Ann Doerr quoted “allows students to become empowered”; Khan quoted “like having free private tutors in the cloud” (della Cava, 2012, p. D1) |
| Khan Academy: “flipping a classroom can sometimes motivate students who have previously been disengaged” (p. 52); “can provide gifted and talented students with advanced content beyond their grade level” (p. 51) (Siegle, 2014) |
| Khan Academy: “Providing high learn” (Gisler & Eberts, 2007, p. E2) |
In sum, the results in table 5 above show that a wide range of strategies were used for the qualities evidence, appeal and credibility; therefore, when reviewing documents promoting innovations one is likely to find many kinds of evidence presented and many kinds of descriptions of credibility. However, overall, it is unlikely that one will read about a research study and if they do, it will often be in passing without detailed descriptions of the methodology. It is almost certain that one will read about benefits offered by the innovation and charged or descriptive language about it. It is less likely that the document will use compatibility, relating the innovation to the readers’ experiences, beliefs and values.

In order to synthesize sub-categories of each of the qualities a degree of judgment was made. For instance, I presented statistics related to the problem the innovation addresses as a form of evidence used in the documents and not a form of credibility and tested at a conference, school, district

<table>
<thead>
<tr>
<th>Innovation in creating change (12 or 19%)</th>
<th>Quality education to anyone, anywhere”; “revolutionize” learning (Cardoso, n.d.)</th>
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<tr>
<td>• Comparing the innovation favorably to other innovations (9 or 14%)</td>
<td>• Khan Academy: Head of education technology and services for Goldman Sachs quoted technology “Technology is doing to education what it’s done to countless other industries: disrupting it” (della Cava, 2012, p. D1)</td>
</tr>
<tr>
<td>• Describing enthusiasm around the innovation (9 or 14%)</td>
<td>• iPad in the classroom: “Enthusiasm is contagious” (“Collaboration is key to ipad implementation”, 2012).</td>
</tr>
<tr>
<td>• Personality/character of the founder (5 or 8%)</td>
<td>• Brain Based Education: “Hottest educational strategies nationwide” (Hobbs, 2007, p. B1)</td>
</tr>
<tr>
<td></td>
<td>• Curriki: “Visionary chairman” (Axelson, 2007, p. 19)</td>
</tr>
<tr>
<td></td>
<td>• Khan Academy: “dedicate himself full time to this labor of love” (della Cava, 2012, p. D1)</td>
</tr>
</tbody>
</table>
or other setting as a form of credibility and not evidence. It is important to examine each of the sub-categories carefully; one might place them differently, however because I have listed the sub-categories separately along with the frequency and percent of mentions across the documents, they can quite easily be arranged into different overarching qualities (evidence, credibility, etc) based on one’s judgment or preference.

**Discussion and Conclusion**

There are a number of implications that arise from these findings. First, for the educator who is looking to learn more about a popular innovation and comes across a document promoting that innovation, it is likely that the document will emphasize appeal and credibility over the other qualities. Of course, as shown in the results, this may relate to the kind of innovation and the idea behind it. If there is inherent appeal behind the idea, as with invented spelling, “appeal” may be emphasized more. If the innovation were a newer technology with many features, qualities like practicality and accessibility may be stressed. As shown in the kinds of quality examples in Table 5, it is likely that the document will use charged and descriptive language about the innovation and talk about general benefits of the innovation; it is also likely that the document will use various strategies to promote the innovation through credibility, though this may take a wide range of forms. With a range of strategies for promoting the innovation being used, and an emphasis on appeal and credibility, it would be important for the educator to take a step back and ask critical questions about the innovation that likely will not be addressed or mentioned within the document. Without a critical stance, the persuasion used, in appealing language, anecdotal examples, described benefits of the innovation, and examples of credibility provided, may quickly sway one’s view to a more positive perception.

However, it is not just the likelihood that the frequency of mentions of appeal and credibility will be greater; the kinds of evidence used to support the innovation are likely to come less from formal research studies, as shown in these results, but from anecdotal forms of evidence related to personal or others’ experiences, general statistics about problems the innovation addresses, and statistics related to use of the innovation. Anecdotal evidence is considered to be a weak and unreliable form of evidence due to small sample sizes, biased examples, and non-representative populations- yet this form of evidence is overwhelmingly used by these documents. Few of the documents mentioned formal research studies; these examples were cursory
descriptions of the study often without detailed descriptions of the sample sizes, research strategy and other aspects of the methodology. Descriptions of larger problems and stories related to successful use of the innovation or in solving these problems can be very effective in capturing attention; a large body of psychological literature has shown the power that emotional appeal and stories have on how people feel and subsequently recall issues (e.g. see Heath & Heath, 2007; Maguire, 1998; Pulizzi, 2012; Simmons, 2006). Given the reliance on these forms of evidence and their strong potential influence, it would be important, again, for the educator or reader to critique and have an awareness of these influences; this could be done by actively seeking out articles that are critical or more hesitant about the innovation; identifying studies that may question the innovation’s effectiveness; or simply by questioning the potential pitfalls about the innovation.

The results of this study provides partial explanation as to why various kinds of innovations that do not yet have an evidence base or that are not supported by research, nevertheless catch on. Even without supporting research evidence, many techniques can be used to promote the innovation, as seen through the use of the six qualities in this study, and that contribute to its hype and ultimate uptake—quantity of the users, anecdotal examples, benefits offered by the innovation or its practicality, appealing ideas, etc.

The research use literature shows that educators often first turn to third-party organizations to learn about research and to improve their practice (Biddle & Saha, 2002; Cordingley, 2008); these organizations translate research and current thinking through various forms of media, including non-peer reviewed articles and various forms of mass, professional and social medias. This study, however, showed that few of these kinds of documents that promoted the innovations mentioned research studies and that they overwhelmingly relied on descriptions related to appeal and credibility to bolster support for the innovation; when there is a building hype around an innovation and when examining those media that promote the innovation, this suggests that educators may need to take additional steps, either on their own or elsewhere, to better evaluate the innovation; not to do so may make them more susceptible to the many faddish kinds of innovations that get adopted without much supporting evidence (e.g. see Cuban, 2004; Ravitch, 2004; Sarason, 1990; Slavin, 1999). There may be media that critiques the innovation as well; seeking out media that is critical or that gives a balanced critique of the innovation may also assist with a more cautious evaluation. This is especially important in a time
where large quantities of free and web-based innovations are being actively promoted in education. An awareness of the role of the media and the various strategies that are used in promoting certain ideas can help in this more informed evaluation.

Given this study examines only those media that promote the innovations, additional research may examine the critique process, particularly in how evidence is used, and compare this to how the six qualities were used in this study focusing on promotion. The relative quantity of material available that critiques or that provides a more balanced overview as compared with those that promote, for those hyped innovations lacking an evidence base, would also be an additional step to build on this work. This study also looks at a range of mediums for promoting the innovations- newspapers, non-peer reviewed journals and blogs; because of this, I did not explore or compare a range of social media forms in depth, though I do use a content analysis process as do other studies reported in the business literature (Smith, Fischer & Yongjian, 2012). Social media has become an increasing area of investigation in the business literature, for instance in examining how companies use various forms of social media to achieve their marketing goals (e.g. Aaker & Smith, 2010; Berthon, Pitt, Plangger & Shapiro, 2012; Kietzmann, Hermkens, McCarthy, Silvestre, 2011; Smith, Fischer, Yongjian, 2012). Smith, Fischer, & Yongjian (2012) do a content analysis of user generated content on the three social media platforms YouTube (a platform for sharing videos), Facebook (an online social network) and Twitter (a microblogging website), inductively creating a framework for comparing brand related user generated responses and testing differences between conversations on the three social media platforms (Smith, Fischer & Yongjian, 2012). Kietzmann, Hermkens, McCarthy, Silvestre (2011) identify seven building blocks (identity, conversations, sharing, presence, relationships, reputation, and groups) of social media activity across different social media platforms (blogs, social networking sites, wikis, etc) and give recommendations for how companies can better understand, respond and monitor them. Examining how the social media in all its various forms (discussion boards, social networking websites, wikis, etc) may facilitate the spread of popular ideas is an important medium that can be further explored specific to the field of education; building on frameworks developed from the business literatures and similar to these business studies, this could take the form of studies that conduct content analyses exploring the nature conversations across these different social media platforms.
Article 2: How Teachers Evaluate Widely Promoted Innovations

Abstract
Currently the education industry has been swept in the language of innovation and what it means to be innovative. Professional organizations promote various innovations, education incubators are being set up to bring new ideas to the market, peer reviewed publications journals use innovation in their title names, and major education associations such as AERA have themed their conference around innovation for improvement of practice. While the conversation around innovation has heated up, an abundance of innovations are freely available on the Internet, many that have gained sweeping appeal. In this study I explore how teachers evaluate a range of widely promoted innovations using a set of six qualities synthesized from the research use and social psychology literatures (compatibility, accessibility, practicality, evidence, credibility, appeal). A survey was used to guide 45 teachers through an evaluation of one of seven innovations and they were asked to follow this with one discussion format of their choosing (the study includes 2 focus groups, 2 online discussion boards, 14 interviews, and 7 written responses). The teachers in the study were open to trying out the innovations; however, they had different strategies for evaluating and selecting the innovations, with practicality being described as an important quality influencing impressions. Evidence in the form of formal research studies was often not a priority and distrusted as a criterion on which to base judgments, with various reasons given for why this was so. The results show how difficult it can be to make a quick and informed judgment about these innovations where the teachers lacked tools to evaluate them consistently and effectively; this suggests an important need that is largely not addressed in teacher training programs and professional development around providing teachers with guidance and training on their search, selection and evaluation processes.

Keywords: educational innovation; evaluation criteria; decision-making; research evidence; fads
Introduction

At the time of this writing, the American Educational Research Association has titled its 2014 conference ‘The Power of Education Research for Innovation in Policy and Practice’ while in Canada the Ontario Ministry of Education held its 2013 Ontario Education Research Symposium with a focus on ‘Innovation for Educational Improvement.’ The promotion of innovations can be found in many places; for instance, some of the major philanthropic organizations (Kauffman, Walton, etc) highlight entrepreneurship and/or innovation as a central approach; various professional associations tout support of innovative practices or various innovations to use; and peer reviewed professional journals use ‘innovation’ in their title names. The past several interviews with leading education change scholars in the 2014 AERA Lead the Change series focusing on the theme of “promising educational change innovations” and the role of research in relation to them, further demonstrates the dominance of discussion on the topic of innovation and evidence; the leaders expressed various thoughts ranging from concerns about a ‘best practices movement’ (issue no. 40), to a push to conceptually clarify innovation’s meaning (issue no. 41), to reflections on how best to transfer practices across contexts (issue no. 38) and the role of ‘systematic experimentation’ (issue no. 39) in the process (Interviews available at: http://www.aera.net/SIG155/NewsAnnouncements/tabid/12194/Default.aspx).

While scholars have reflected that little has changed in teaching practice (Cuban, 1993; Payne, 2008), the heated conversation around innovation in education is happening at a time where many education innovations (and historically) have gained sweeping appeal and are easily accessible to teachers (e.g. iPads in the classroom, open source courseware such as Khan Academy, and practices such as brain based education, timers, action research, portfolios and whole language instruction, to list a few). These innovations are popular in the sense that they command significant presence in the larger education discourse or are widely adopted. Most widely circulated innovations have been supported by some research findings, some more strongly, however others have also been demonstrated as ineffective or costly as well (e.g. themed high schools, laptops for all students, Smartboards). Why do the latter type continue to spread and have tractive with the work of educators? What is the role of research in this process? Tyack & Cuban (1995) in their influential work suggest how many industries in our society are faddish (or widespread but possibly short lived). Particularly in education, reforms and proposed changes are often like ‘fireflies,’ they “shine brightly for a few moments and then disappear” (Interview
with Cuban quoted in O’Neil 2000: 6).” Countless reforms tend to come and go; like a pendulum, ideas for change take a swing in the public’s eye, catching the imagination briefly, and then fade out only to be re-introduced a decade or two later (Cuban, 1990; Slavin, 1999). Education also sees once popular innovations lose steam (e.g. mandated class size reduction, differentiated staffing, whole language).

Practitioners and community members at all levels of the education system (teachers, administrators, resource specialists, etc) will encounter (and can also create and lead) innovations, through formal or informal networks, professional development opportunities, or via their own search for resources to better inform or supplement their practice. It is therefore of great importance that practitioners develop the evaluative skills to distinguish those evidence-based innovations that are effective and of real value from those that simply sound or look good. Given the bountiful amounts of freely available innovations on the Internet that teachers may turn to, school districts and ministries also play an important role in guiding educators through their search processes, as well as in selecting and providing these innovations to them.

One might consider innovation as the process of making change, both radical and incremental, and as a particular idea, practice or thing perceived to be new by those who are considering it adoption. In this study I define innovations, similar to other definitions that emphasize an element of novelty and its resulting change, as those ideas, practices, products, and services that change the system in which they are introduced. Although there are several popular articles describing the context of trendiness and fads (Cuban, 2004, 2008; Ravitch, 2004; Slavin, 1999), there is less empirical work in this area. These studies are often singular cases of faddish innovations; they do not compare across different kinds nor examine the role of evidence in their uptake (e.g. Frank, Zhao & Borman, 2004; Renzulli & Roccigno, 2005; Zemsky & Massy, 2004).

The trendiness of innovations is important to consider at a time where a number of services and programs have evolved in the public and private spheres in education (e.g. curricular development companies, blended learning models, alternative teacher licensure, voucher and charter school programs, assessment management technologies, etc). In the United States incubators, or organizations that provide seed funding, consultation and other supports necessary to accelerate the startup process of companies, are developing products for educators (e.g. Kauffman Labs Education Venture Program and San Francisco based Imagine K12) and districts are contracting with private companies for services such as Renaissance Learning (Data-
Driven Software) and SchoolNet (instructional management tools) (Burch, 2009). The sheer abundance of resources and innovations available on the World Wide Web poses a challenge to educators in knowing how to sift through and judge which are reliable (Carrier et al., 2014). There is a concern that companies increasingly market their products as evidence-based (Anderson & Herr, 2011); this may make it more difficult to discern those innovations that are credible from those that may be faddish, or widespread albeit short lived.

Choices about which innovations to support can be made at many levels; by venture capitalists, who choose which kinds of innovations to fund; by school districts contracting with companies for services; by principals leading their schools in the use of innovations; through professional events and conferences hosted by the district or membership associations that may feature innovations; and by teachers themselves, in their own search and selection processes. While there are many ways one could choose to examine the circulation, implementation, and adoption processes of innovations, given the large number available to teachers, I am interested in the question of why and how these ideas appear attractive to practicing teachers. Districts may provide teachers with innovations, however systems also may vary in terms of the level of autonomy teachers feel in selecting which innovations to use in their classrooms. Extensive literature has shown that the implementation of a new practice, innovation, policy, etc. often changes based on teachers’ interpretations, resulting in varying outcomes (e.g. Anderson, 1997; Berman & McLaughlin, 1976; Datnow, Hubbard & Mehan, 2002; Fullan, 1982) and as Doyle & Ponder (1977) suggest in their widely cited paper on the decision making processes of teachers as they encounter innovations, “Failure to acknowledge teacher decision making does not, however, neutralize its impact on change efforts. Although the mechanisms of an innovation project may cause teacher judgment to remain dormant, the ultimate fate of an innovation would seem to depend upon user decisions (p. 3).”

In this study, I explore how teachers evaluate innovations that are in wide circulation, ones that catch on and gain enthusiasm rapidly within a short time period (in either discourse and/or use). Examining these perceptions may provide insight into the complexities around how a teacher comes to decide what innovations to use and what ideas hold the greatest promise, in essence how both the ‘hype’ around the general idea, and the characteristics of the innovation presentation, influence their general perception. The intent is to understand how various characteristics of the innovations, in their presentation design, evidence base, language use, and
other qualities, influence teachers’ perceptions of the innovation and consequently their decision to use it. I ask, “How do teachers evaluate widely promoted innovations?” and “How do teachers search for and select innovations?” Objectives of the study include 1. To understand how teachers evaluate innovations that are in wide circulation, particularly as related to a set of six qualities as synthesized from the research use and social psychology literatures (credibility, evidence, accessibility, practicality, appeal, compatibility) with a focus on relating the quality evidence to the other five, described in more detail below and 2. To explore the various ways teachers talk about searching for, narrowing down and selecting innovations (those produced externally and not by the teachers themselves) to use. Below I briefly explore three separate albeit relevant bodies of literature that inform this work; the marketing of innovations and the social psychology of persuasion; research use, particularly in how teachers’ engage with and use research; and the decision making process of teachers in selecting innovations.

The Marketing of Innovations

Scholars have suggested that faddish, or widespread, educational innovations are often re-packaged from the reforms of the past and marketed in ways that make them appealing to their audience (Ravitch, 2004; Slavin, 1989). They may be advocated by someone well known in the field, make reference to those that are credible, use stories or case examples that inspire, appeal to emotions, and be aligned with the current political climate of the time. Slavin describes the marketing process of these innovations in his article the PET and the Pendulum (1989). While innovators often claim supportive research, these are often just a few “gee whiz” cases of a school or district or two that tried out the program and apparently had success. Or, the advocate of the innovation may suggest that the principle behind the program is supported by research though it has not yet been formally evaluated (Slavin, 1989, p. 753). The innovation may even be disguised by a title or name. As Ravitch (2004) describes, “When whole language first became popular, its proponents called it ‘psycholinguistics’ in order to suggest that their approach had a scientific basis (p. 37).” Indeed, educators may be prone to the “bandwagon effect,” where “what’s new is questioned, until certain key players buy in” and where teachers then become susceptible to ideas “labeled as ‘research-based,’ ‘best practices,’ or ‘standards-based’” (Pennington, 2009, para. 2).

There is a very large industry about marketing and around the psychology of persuasion, appealing to individuals’ identity and emotions and paying attention to how information is communicated. Influence lies at the heart of marketing communications (Davies & Powell, 2012).
where the psychology of persuasion explores how people can be guided to adopt or gravitate towards ideas and behaviors (Ajzen, 1992; Cialdini, 1994; Wood, 2000). Often work in this area delves into individuals’ motives (Deutsch & Gerard, 1955; Cialdini & Trost, 1998) and cognitive thought processes (e.g. Chaiken, 1987). In brief, this literature points out that there may be several systematic biases in peoples’ thinking (Kahneman, 2011), that people are guided by emotions and different motives (Wood, 2000) and that these characteristics may be used strategically in persuading others to believe or act in something (Ajzen, 1992).

**How Teachers Engage With and Use Research**

Evidence is consequential to the understanding of how ideas in education are taken up. Several disciplines or areas of work examine ways to strengthen connections between research, policy and practice (e.g. knowledge mobilization, knowledge transfer, knowledge exchange, research utilization, etc). The intent of this work is to enhance relationships between research users (teachers, school districts) and research producers (universities and intermediaries such as nonprofits and professional associations); build the users’ ability to access, interpret, evaluate and use research; and develop methods by which research can be more effectively communicated across organizations thereby increasing its access and the likelihood of its use. Given that this study explores how teachers evaluate innovations, and in their assessments of evidence supporting the innovation, this literature is particularly relevant.

While there has been a growing interest in strengthening links between research, policy and practice in education and other fields (Estabrooks, Derksen, Winther, Lavis, Scott, Wallin, Profetto-McGrath, 2008), connections in education are not optimal (Broekkamp & Hout-Wolters, 2007; Vanderlinde & van Braak, 2010). There are many reasons cited for the research to policy and practice gap including poor communication mechanisms for disseminating research, political pressures, and problems with research design (e.g. Levin, 2013). One important area addressing this gap has been to examine the ways educators interact with and use research (Bell, Cordingley, Evans & Holdich, 2004; Klinger, McAdie, Sebok & Mills, 2012; Nelson, Leffler & Hansen, 2009).

Studies show that there are many barriers to teachers accessing and using research. Teachers may perceive research to be incorrect, contradictory, or not relevant (Fleming, 1998); feel they lack the skill set to evaluate research (Zeuli, 1994); not know how to translate research findings to practice (Estabrooks, Floyd, Scott-Findlay, O’Leary, & Gushta, 2003); and lack time...
in their process of evaluation (Borg, 2009; Retsas, 2000). In addition, there may be several obstacles in terms of how the research is presented and designed itself, for instance, the research setting may be different than the school or classroom setting the teacher is in with limitations in the findings (Nelson, et al., 2009); and it may not be communicated in a way that is accessible (Davies & Powell, 2012). Although various intermediaries or third party organizations play critical roles in sharing research (Honig, 2004; Ward, House & Hamer, 2009), weak dissemination practices are also a concern, where research producing organizations such as universities have been found to take passive roles in distributing findings (Qi & Levin, in press).

In addition, research use is an interpretive process (Coburn, Honig & Stein, 2009) where beliefs, experiences and relationships act as strong mediators (Coburn & Talbert, 2006; Cordingley, 2008; Landry, Amara, Lamari, 2001). Beliefs are “deeply personal, rather than universal and unaffected by persuasion… formed by chance, an intense experience, or a succession of events, and they include beliefs about what oneself and others are like (Bandura, 1986: p. 309).” They persevere from early age into adulthood, and act as “filters to the world, screening and re-shaping information in its image (Pajares, p. 324).” An individual’s interpretation of and access to research is also often filtered through the views of personal social networks, where there is a preference for practice that is consistent with social expectations (Coburn et al, 2009; Lavis, 2006; Mitton, Adair, McKenzie, Patten & Perry, 2007; Nutley, Walter & Davies, 2007). The larger social context has a strong influence including ideologies, larger discourses in the profession, and peer and public opinion (Cordingley, 2008; Snell, 2003). The dominant educational discourses may be misleading, where those who have framed public discourse (e.g. media) may have done so in a way that trivializes issues and presents them in a “naïve and simple-minded manner” (Purpel & Shapiro, 1995:3).

The way the research is presented also matters, where studies have shown that educators may have particular preferences in its presentation (CUREE, 2007; Williams & Coles, 2003). For instance, in Williams and Coles’ study (2003) on the use of research by teachers, accessibility and time-saving were key priorities for teachers, where participants preferred summary statements, informal language, and less dense text to scan and find relevant areas quickly.

**How Teachers Decide Which Innovations to Use**

There has been some literature, though not recently, describing the decision making process of educators as they decide which innovations or change proposals to adapt. For instance,
in their paper on the ‘practicality ethic’ of teachers, Doyle & Ponder (1977) point out that of the myriad of messages teachers may receive on a day to day basis about how to improve their practice, those they see as practical are the ones that they are more likely to choose to implement. Teachers, in this sense, are “pragmatic skeptics” where reactions to proposals to change or improve practice are taken into account in the ecological sphere of the classroom, with its pressing demands. Change proposals that have some ‘instrumentality’ (classroom procedures), and ‘congruence’ (extent that the proposal matches with the educators’ perception of their classroom condition) are ones, Doyle & Ponder suggest, that will have a better chance at changing teachers’ behaviors. Shavelson & Stern (1981) describe some of the factors that contribute to teachers’ pedagogical decisions and judgments including information about the students, teachers’ use of heuristics, teachers’ judgments about students, teachers’ background characteristics such as beliefs, and overriding institutional constraints. More recently, scholars have called for the increased empowerment and engagement of teachers through strengthened forms of professional development, allowing them greater autonomy and power in decision-making (Hargreaves & Fullan, 2012).

**Conceptual Framework**

The following set of qualities were generated through a careful review of the literature on research use, particularly studies that have looked at teachers’ interpretation of educational research (Borg, 2009; Cordingley, 2008; Joram, 2007; Pajares, 2002; Williams & Coles, 2007) and on their specific preferences, needs and desires around its format of presentation (Blamires, Field & Wilson, 2010; Cordingley, Bell, Evans & Holdich, 2005; CUREE, 2003, 2007; NTRP, 2000); this review was also informed by the social psychology literatures on persuasion and influence (e.g. Cialdini & Trost, 1998; Briggs & Stuart, 2006; Kahneman, 2011). I draw from the research use literature because innovations, as they are presented on websites, are supported by various kinds of evidence, while literature on teachers’ preferences around innovation format of presentation is scant. Given the increased attention and dialogue around research evidence and its use in policy and practice, in the findings of the paper I emphasize and discuss the quality of ‘evidence’ in relation to the other five in more depth; this is also along the lines of the interview questions guide that asks the teachers to speak about evidence in relation to the other five qualities. Below I provide a description of each of the qualities.
Evidence - This refers to the teachers’ assessment of the quality of the research supporting the innovation itself. Indicators of quality evidence may influence teachers’ judgments, including the presence of citations, testimonials from experts, and references to different kinds of studies, as indicators of the research’s quality (Litman 2012; Reid & Gough, 2000).

Compatibility - Teachers tend to prefer research that is compatible with their prior understanding and experience as an educator. Teachers are less likely to pay attention to evidence in areas where they have deeply held beliefs, particularly if this evidence is not consistent with these prior beliefs and experiences (Borg, 2009; Joram, 2007; Levin, 2004; Honig & Coburn, 2008).

Practicality - Teachers tend to prefer research that is relevant to their current practice, where abstract principles are connected to detailed illustrations and practical examples (Robinson, Hohepa & Lloyd, 2009). In addition, there is a clear focus on teaching and learning, and the educator is able to quickly discern how the research informs her/his own work (CUREE, 2003, 2007).

Accessibility – Teachers tend to prefer research that is presented in an accessible way, for instance, with the assistance of summary statements, accessible and clear writing, and an organized flow.

Appeal – This refers to the overall appearance and appeal of the research. Does it appear professional in format? Is it personalized (educators prefer a report that they can relate to personally in some way)? Would it be fun to read and/or use in practice? (Davies & Powell, 2012)

Credibility – This refers to the producers of the research themselves, the funding behind the research, the affiliated organization, etc. Teachers tend to prefer research from those organizations that they know or have heard of, and research that is referred through informal rather than formal networks. It is also helpful if the researcher or the affiliated organization is recognizable to the educator, in a positive way (Cordingley, 2008; Nutley et al, 2007; Maynard, 2007).
Because I am interested in teachers’ evaluations as they relate to the research or evidence supporting the innovation, I used these qualities as a guide in the survey, a process I describe in more detail in the methods. These qualities address the research questions related to how the teachers evaluate the innovations; however several other questions relevant to how teachers searched for and selected the innovations and in formulating their overall impressions, are also included in the survey/interview guide and appear as themes in the results.

**Methods**

**Selecting the Innovations**

My intention in selecting the innovations was to find a variety of kinds of ideas, practices, and products referred to as ‘innovations’ that were of relevance and interest to classroom teachers, things that they could readily implement in their classrooms. While my intent was to look at popular innovations in wide circulation (in discourse and/or use), a number of indicators could signal an innovation’s spread; for instance, the innovation may have been widely used; it may have been the topic of frequent discussion in mass media outlets; or it may have become popularized in several, but not all areas of a country. For purposes of the study, the innovation needed to meet at least 4 of the following 6 criteria I created indicating different kinds of ‘spread:’ presence of either a Twitter hashtag or Facebook page; search for the innovation and blog resulting in at least 10 blog entries and or/discussion Listservs and a Wikipedia entry; reported in at least 3 mass media outlets (at least 1 television program and at least 1 national newspaper); reported at least five times as an article of focus in major popular education periodicals; produced over 100,000 hits for online Google search of the innovation name; had a user base of at least 100,000 individuals or 10 schools or 5 school districts (only if known).

Some of the innovations I selected are newer and lack a strong empirical base (Khan Academy, iPad in the classroom, Curriki, Edmodo). Others have been around for some time but are still widely used; these are interesting in that there have been concerns raised and debates about their efficacy in the research literature (Brain Based Education, invented spelling, Irlen Method). For the latter, this means that there have been many studies in the literature that report that use of the innovations produces neutral or negative results, and therefore that the
innovations do not have a strong research base to support their claims. Several of these innovations are web-based innovations (Curriki, Edmodo, Khan Academy); others are practices supported by companies (Brain Based Education by Jensen Learning and the use of colored overlays by Irlen Method; iPad in the classroom by Apple); the final, invented spelling, is a general practice idea with descriptions provided by many sites. I provide a brief description of each innovation along with the website link(s) representing the innovations that were included in the survey. An effort was made to distribute the teachers across the innovations, for the various discussion formats. Next to the innovation name, I list the number of participants by discussion format in parentheses. While 8 teachers in the study did not complete a follow up discussion format, their responses were included as the survey had space for written responses to the ratings.

*Curriki* (two focus groups including three teachers for each for a total of six teachers, two written responses, one interview, and three teachers who did not participate in a follow up discussion)-
http://www.curriki.org/  Founded in 2004, Curriki offers thousands of free teaching resources (lesson plans, etextbooks, assessment activities, videos, simulations, etc) and curricula (according to its website, over 50,000) across grade levels and subject areas. Teachers can search for resources by topic, grade level, resource type and other categories; its members publicly rate each resource.

*Edmodo* (one online discussion board of five teachers, four interviews)-
https://www.edmodo.com/  Founded in 2008 and with over 33 million users, Edmodo is a free site, similar to a Facebook design, that offers collaborative tools for the classroom, including a communication platform, a variety of learning applications to supplement classroom instruction, and assessment tools such as quizzes and polls.

*Invented Spelling* (two interviews and two written responses)-
http://www.readingrockets.org/article/267; http://www.greatschools.org/students/academic-skills/384-invented-spelling.gs)  Invented spelling is an approach that encourages students to write freely without attention to the spelling of words that might disrupt the flow of writing and expression of ideas.
Pad in the classroom (two teachers who did not participate in a follow up discussion)- iPads are featured on Apple’s website as a tool for use in the classroom (https://www.apple.com/education/ipad/teaching-with-ipad/). iPads offer over 65000 applications targeted towards teaching and learning, including a variety of multimedia, note taking, presentation, assessment and many other tools.

Irlen Method (one online discussion board of five teachers, two written responses, one interview, two teachers who did not participate in a follow up discussion)- http://irlen.com/ Founded in 1983 and with over 170 clinics, the Irlen Institute is an organization that provides ‘irlen filters’ or colored overlays and lenses to address Irlen Syndrome, a perceptual processing disorder. The company offers diagnostic services and addresses a range of issues including reading problems, headaches, ADHD, autism, brain injury, low motivation and medical conditions. According to its website, irlen spectral filters are “individual, precision-tinted lenses that filter out the offensive wavelengths of light, allowing the brain to process visual information correctly” where the filter color is determined by a patented testing process to address the specific issue. Screening for irlen syndrome and lenses are not free.

Khan Academy (2 interviews, 1 writing)- https://www.khanacademy.org/ Funded by the Gates Foundation, presented on the television show 60 minutes, tweeted over 28,000 times (as of June 2012), and with millions of independent users (as reported on its website), the Khan Academy is a non-profit organization (founded in 2006) that offers brief video lesson clips with simple visuals online free of charge, in several languages, across a range of subject areas including math, science, economics and the humanities. The organization is often associated with the ‘flipping the classroom’ approach where students watch videos or instructional materials as a form of self-instruction; in class time is spent on reviewing problems and discussing questions and ideas.

Brain Based Education (4 interviews, 1 no follow up)- http://www.jensenlearning.com/what-is-brain-based-research.php Founded in 1994, Jensen Learning offers workshops, products (dvds, books, videos, etc), and certifications, that are based on the brain based approach, one that supports the use of strategies based on what is known about how the brain functions optimally.
Selecting the Teachers

This study includes 45 current or former elementary school teachers with at least one year of teaching experience in grades K-5. All the teachers were asked to complete a survey guiding them through an evaluation of one of seven education innovations in addition to follow up discussion of their choosing (either a written response, interview, focus group or online discussion). The teachers represent a range of years of experience, age, gender and grade levels. 33 (73.3%) are female and 12 (26.7%) are male. 23 (51.1%) of the teachers were from Canada, 19 from the United States (42.2%) and 3 had most recently taught internationally (China, Chile, Venezuela) but also had experience in coursework and/or teaching in either Canada and/or the US. 5 (11.1%) teachers represented in the sample were not currently teaching (1 retired teacher, 3 pursuing masters degrees without a current teaching position, and 1 pursuing neither teaching or coursework) and only 6 had no additional qualifications beyond the teaching credential (13.3%). More than half or 23 (51.1%) of the teachers had graduate degrees, 13 (28.9%) earned a specialization, and 16 (35.6%) listed other forms of training. A detailed demographic chart is presented in Appendix B along with additional information about the participants.

In Ontario, teachers were recruited through personal and university contacts as well as courses and study invitations posted on bulletin boards at the Ontario Institute for Studies in Education, University of Toronto. For courses, I emailed individual course instructors directly and asked if I could attend their class and share the study/invitation letter with students. In California, teachers were recruited via personal contacts, email alumni Listservs at the University of California, San Diego, and by distributing the invitation letter to local schools in person. For both, I used a snowball approach to identify additional teachers. My sample is not representative of any particular group of teachers and therefore suggestive and would need to be followed up by a more rigorous defined sample to make claims about a particular group or context; however, as discussed in the sampling justification in appendix C, when reviewing the data, it didn’t appear that country was a more significant factor than age, gender, district, experience or other variable where the data showed that the teachers’ evaluations were strongly influenced by their personal and teaching experiences. However, the consistency of some of the findings across such a diverse group of teachers as was included in this study strengthens those findings.
**Survey**

In the study, the teachers were first asked to complete a survey that guides them through an evaluation of one of the seven innovations. The survey was developed in tandem with a larger Social Sciences and Humanities Research Council (SSHRC) funded project at the University of Toronto, of which I was a project lead at the time of its creation; it was piloted with a group of teachers and was reviewed by a research team specializing in the area of research use. The teachers were intentionally matched to an innovation they had no prior experience using (however they may have been familiar with/heard about it) in order to learn about their initial impressions and evaluation process without influences through actual use. In the survey, the teachers were asked to do a quick 3 minute review of the innovation as presented on website(s) (the innovation website links were embedded in the survey instrument) and asked to rate the innovation from 0-10 along sub-categories of the six qualities discussed above (compatibility, accessibility, evidence, credibility, practicality, and appeal), 0 as very low, 5 as moderate, 10 as very high. The sub-qualities were more specific and also identified from the research use literature. Following the ratings, participants were then asked to rate the innovation on their perception of its overall value to educators, the likelihood they would use the innovation (with no external constraints limiting their decision such as time, finances, workplace conditions, etc) and the likelihood the innovation was in the real world in which they worked, following the same 0-10 scale as the quality ratings. The final questions asked about how each quality influenced their overall judgment about the innovation from 0-10 (0 as little influence, 5 as moderate influence, 10 as very high influence) and requested that the participants rank the three most important qualities that influenced their overall judgment. The intent of these final questions was to understand which qualities seemed to matter more in influencing teachers’ judgments. Spaces within the survey were left for the teachers to explain their ratings. A copy of the survey instrument is provided in Appendix E.

**Follow Up Discussion**

Upon completing the survey, the teachers were asked to participate in a follow up discussion in a format of their choosing (written response, 15-30 minute semi-structured interview, focus group or online discussion). There are many advantages to using multiple methods in the follow up. Strategically this approach helped with recruitment as it accommodated scheduling needs. In addition, each approach had potential to yield useful kinds
of data, with differing limitations. For instance, interviews are often better for learning about participants’ individual views without the influence of a group as well as allowing for follow up questions, while a focus group allows participants a chance to respond to one another and discuss disagreements and different perspectives. Online discussion boards are useful for anonymity but more difficult in terms of the continuity of the discussion and potential brevity of comments. 38 of the 45 teachers completed one form of follow up discussion; the study includes 14 audio-recorded interviews lasting 15-30 minutes each; 7 written responses; 2 audio-recorded focus groups of 3 participants each (about 30 minutes each) and 2 online discussion boards of 5 participants each (approximately 3 weeks in length with 1-4 log-in responses from participants). One focus group (Focus Group 1\(^2\)) consisted of teachers in a private school in Southern California and the second of teachers who had most recently taught in China, Chile and Ontario, one for each (Focus Group 2), both discussing the innovation Curriki (this innovation was selected for practical reasons- all participants could not have a background using the innovation). The online discussion boards consisted largely of public school teachers from the United States with the exception of one teacher currently teaching in Venezuela; one board focused on the innovation Edmodo and the other on Irlen Method.

Questions used for the focus groups, interview and written responses were identical. The questionnaire first invites the educators to reflect on any general thoughts they had about the innovation (what they thought about it overall, why they rated it the way they did, what stood out about it), followed by questions about their quality ratings in the survey, and a few questions relating to innovations more generally, including their search processes and training around finding/evaluating innovations. The questionnaire is provided in Appendix D.

Teachers in the online discussion board were assigned unique (e.g. Edmodo 1, Edmodo 2, etc) user names to ensure anonymity in the discussion. I used a forum titled the OrionCollaboration (www.othree.ca) for its simplicity of use and university-affiliation. The teachers in the board were first invited to share any general thoughts about their evaluation process, similar to the other discussion formats, and then to respond to each others’ initial reflection. Following this, I provided the survey results for the innovation on the board and asked for any reflections about these results.

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\(^2\) I will refer to these focus groups as Focus Group 1 and Focus Group 2 for the remainder of the document
Analysis

All interviews and focus groups were transcribed; after reading the transcripts and written responses, themes related to the research questions were identified through an inductive process and separated into two excel documents. One excel document recorded the number of times each teacher mentioned a theme or idea in order to see the frequency and consensus of opinion across the data. The second excel document separated narrative text by theme. The data were organized into rows by the teacher identifier and associated innovation. The survey data was imported into SPSS v. 20 via the survey program SurveyGizmo; descriptive statistics were run on the data for frequencies, means and standard deviations. Because the sample is relatively small (45 participants) no inferential statistics were conducted; the intent of the survey was to provide consistent data on how the teachers in the study rated and thought about their associated innovations. I also interpreted the survey responses in light of the more qualitative data to see if the findings aligned.

Findings

Openness to Innovation

The interview findings revealed a high receptivity and willingness to put to use the various innovations. These findings are reflected in the survey responses for the 45 teachers. On a rating scale from 1 to 10, 1 as very low, 5 as moderate, and 10 as very high, teachers were asked in the survey to rate on their perception of the innovation’s overall value to educators, how likely it was in the real world in which they worked and the likelihood they would use the innovation. The data reported in Table 6 show that across the innovations the mean ratings were all above 6 with 4 of the 7 innovations reporting means above 7 for the participants’ perception of the innovations’ overall value to educators. Similarly, the survey results reported a high likelihood to use the innovation if there were no constraints, with mean ratings between 6.2 and 9 for the 7 innovations, and above 7.1 for 4 of the 7 innovations. Mean ratings for likelihood to use the innovation in the real workplace rated lower, as would be expected, with 3 of the 7 innovations rating above 6 and only 2 falling below 5, suggesting that teachers felt some desirable innovations would not be supported or feasible in their school or district. The mean ratings on the various qualities for the innovations are presented in Table 7. These findings are also reflected in the interviews and written responses. When asked, all 14 (100%) of those interviewed
said they would be willing to try out the innovation they were asked to evaluate, in their classroom, even if they had reservations, concerns or lack of understanding about the innovation. 11 of the 14 (78%) teachers suggested their innovation held an overall appeal to them. 3 of the 7 (42%) who responded in writing as well as the teachers in Focus Group 2 explicitly stated a strong attraction towards their innovation and willingness to use it.

*Table 6: Overall Value of and Likelihood to Use the Innovation*

<table>
<thead>
<tr>
<th>Innovation</th>
<th>Brain Based Education (N=5)</th>
<th>Curriki (N=12)</th>
<th>Edmodo (N=9)</th>
<th>Invented Spelling (N=4)</th>
<th>Irlen Method (N=10)</th>
<th>iPad in the Classroom (N=2)</th>
<th>Khan Academy (N=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>6.0</td>
<td>6.7</td>
<td>7.3</td>
<td>7.0</td>
<td>6.6</td>
<td>7.0</td>
<td>7.3</td>
</tr>
<tr>
<td>SD</td>
<td>1.2</td>
<td>1.7</td>
<td>1.7</td>
<td>1.4</td>
<td>2.3</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>Perception of Innovation’s Overall Value to Educators</td>
<td>6.2</td>
<td>6.8</td>
<td>2.8</td>
<td>7.1</td>
<td>7.5</td>
<td>6.5</td>
<td>9.0</td>
</tr>
<tr>
<td>Likelihood to Use the Innovation with No Constraints</td>
<td>6.0</td>
<td>6.7</td>
<td>2.0</td>
<td>5.2</td>
<td>7.0</td>
<td>5.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Likelihood of Innovation in the real world in which the educator works</td>
<td>6.0</td>
<td>6.7</td>
<td>3.2</td>
<td>7.0</td>
<td>2.9</td>
<td>2.6</td>
<td>4.7</td>
</tr>
</tbody>
</table>

While Table 6 above asks the teachers to rate on overall impressions of the innovation, including perception of the innovation’s overall value to educators and likelihood to use the innovation with no constraints or in the real world in which the educator works, Table 7 below asks teachers to rate the innovations more carefully along sub-qualities of the six overarching qualities (compatibility, evidence, practicality, accessibility, appeal and credibility). Here we can see that mean ratings are reported at moderate to high across the qualities; mean ratings for 6 of the 7 innovations and across all sub-qualities with the exception of consistency with what peers, colleagues and friends believe (sub-quality of compatibility), and credibility of brand and user base (sub-qualities of credibility) were all above 5. Therefore in addition to reporting high mean ratings of overall impressions of the innovations, the teachers reported moderate to high ratings across most of the sub-qualities across the innovations, reflecting overall favorable perceptions about the innovations.
Table 7: Descriptive Statistics for Ratings of the Innovation by Quality

<table>
<thead>
<tr>
<th>Qualities</th>
<th>Brain Based Education (N=5)</th>
<th>Curriki (N=12)</th>
<th>Edmodo (N=9)</th>
<th>Invented Spelling (N=4)</th>
<th>Irlen Method (N=10)</th>
<th>iPad in the Classroom (N=2)</th>
<th>Khan Academy (N=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consistency with prior beliefs</td>
<td>6.8</td>
<td>1.3</td>
<td>7.5</td>
<td>1.8</td>
<td>7.7</td>
<td>1.4</td>
<td>6.0</td>
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<tr>
<td>Consistency with prior experiences</td>
<td>6.2</td>
<td>1.3</td>
<td>7.4</td>
<td>1.7</td>
<td>7.9</td>
<td>1.5</td>
<td>5.5</td>
</tr>
<tr>
<td>Consistency with what peers, colleagues and friends believe</td>
<td>6.6</td>
<td>1.5</td>
<td>6.6</td>
<td>1.7</td>
<td>7.4</td>
<td>1.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Evidence: How strong is the evidence on the site(s) supporting the use of this innovation?</td>
<td>4.6</td>
<td>2.1</td>
<td>6.6</td>
<td>1.8</td>
<td>6.6</td>
<td>1.4</td>
<td>5.8</td>
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<tr>
<td>Practicality</td>
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<tr>
<td>Ease of Use</td>
<td>5.4</td>
<td>1.8</td>
<td>7.5</td>
<td>1.9</td>
<td>7.3</td>
<td>2.3</td>
<td>6.8</td>
</tr>
<tr>
<td>Likely to Remain useful over Time</td>
<td>5.2</td>
<td>1.1</td>
<td>7.0</td>
<td>2.1</td>
<td>7.3</td>
<td>2.4</td>
<td>6.3</td>
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<tr>
<td>Accessibility</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Clear Purpose</td>
<td>5.2</td>
<td>0.8</td>
<td>7.6</td>
<td>1.6</td>
<td>8.1</td>
<td>2.0</td>
<td>8.3</td>
</tr>
<tr>
<td>Transferability (can be used in many contexts, with different students)</td>
<td>5.2</td>
<td>0.8</td>
<td>7.0</td>
<td>1.9</td>
<td>7.3</td>
<td>2.3</td>
<td>7.5</td>
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<tr>
<td>Appeal</td>
<td></td>
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<tr>
<td>Personalization</td>
<td>5.0</td>
<td>2.3</td>
<td>6.4</td>
<td>2.6</td>
<td>7.7</td>
<td>2.1</td>
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The findings in table 6 indicate high mean ratings across the innovations on the perception of the innovation’s overall value to educators (all above mean ratings of 6) as well as a high likelihood to use the innovation with no constraints (all above mean ratings of 6.2); table 7 on the mean ratings of the various sub-qualities of the innovation shows interestingly that the mean ratings for practicality (for 6 of the 7 innovations ease of use and likely to remain useful over time mean ratings were above 6.2) and accessibility (for 6 of the 7 innovations clear purpose and transferability mean ratings were above 6.5) overall were reported at higher rates than the mean ratings for qualities such as appeal (e.g. personalization and innovation looks enjoyable to use, where mean ratings fell below 6.5 for 4 of the 7 innovations). In addition, mean ratings for evidence across the innovations (falling below 6 for 3 of the 7 innovations) were lower across the innovations than table 6 ratings on the overall value of and likelihood to use the innovations. This suggests that some qualities may be more influential than others in influencing the overall impressions reported in table 6. In the follow up discussion formats I ask the teachers to talk about the qualities in terms of their relative importance in informing their overall impressions about the innovation, findings I discuss in further depth below.

It is important to remember that the teacher rated the innovation based on a website link; in some cases the innovation was the website itself (e.g. Khan Academy) and in others the website link was a description about the innovation approach (e.g. invented spelling). In order to address

<table>
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<tr>
<th>Appeal</th>
<th>5.0</th>
<th>2.3</th>
<th>6.4</th>
<th>2.6</th>
<th>7.7</th>
<th>2.1</th>
<th>5.3</th>
<th>4.0</th>
<th>5.4</th>
<th>3.1</th>
<th>9.0</th>
<th>0</th>
<th>8.7</th>
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<tr>
<td>Personalization (connects with you on a personal level)</td>
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<tr>
<td>Innovation looks enjoyable to use</td>
<td>4.6</td>
<td>2.7</td>
<td>6.6</td>
<td>2.1</td>
<td>8.2</td>
<td>1.8</td>
<td>5.3</td>
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<td>5.7</td>
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<td>9.0</td>
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<td>8.0</td>
<td>2.0</td>
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<td>Credibility</td>
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<tr>
<td>Credibility of developer</td>
<td>4.6</td>
<td>3.0</td>
<td>6.4</td>
<td>1.9</td>
<td>6.4</td>
<td>2.9</td>
<td>6.3</td>
<td>2.3</td>
<td>5.9</td>
<td>2.6</td>
<td>8.0</td>
<td>0</td>
<td>8.0</td>
<td>1.0</td>
</tr>
<tr>
<td>User base (likelihood it is being used widely)</td>
<td>3.6</td>
<td>2.5</td>
<td>7.0</td>
<td>2.1</td>
<td>7.4</td>
<td>2.0</td>
<td>3.7</td>
<td>3.2</td>
<td>5.4</td>
<td>2.7</td>
<td>7.0</td>
<td>1.4</td>
<td>7.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Credibility of</td>
<td>3.2</td>
<td>2.6</td>
<td>6.3</td>
<td>2.1</td>
<td>6.7</td>
<td>1.7</td>
<td>N/A</td>
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this a N/A option was included along with the option of rating it from 1 to 10. However, each website included some description about the innovation overall as well as other forms of support such as research studies, testimonials, descriptions about the founders, lists of awards, etc., varying by website, that the teacher could use to assist in their ratings of the various sub-qualities.

The teachers expressed a strong interest in being able to explore potential resources and innovations. However, they felt that limited time and the every day demands of the classroom kept them from being able to do much of this kind of work. This teacher spoke about her joy and interest in improving her practice.

I wish that I had more time to do that. That’s one of my favorite things about teaching, looking for what else is going to work, what’s going to work better, how I am going to improve in my own teaching practice and thinking about my school as a whole. You always want to be the best you can be and improve in your craft, that looking for and talking about these innovations, that this was something that was valued enough that we were given more time to do it. It’s your free time you’re not spending a lot of your work hours doing that, because there are so many other things going on. Even if the district supports it, the general public does not necessarily understand how important it is, things like in service days, and modified schedules that allow for teacher collaboration.
Grade 1 teacher US, Khan Academy

Interestingly, the 3 teachers who had a negative overall impression of their innovation went on to say that they would be willing to try it out. For instance, two teachers who evaluated Brain Based Education were concerned about the lay out, where for one the ‘wordiness’ and ‘font colors’ were off-putting and where both could find few examples of teachers using it in practice; despite these reservations, when asked if they would be willing to try out the innovation, they both said yes. As one remarked, “I feel like as a teacher I’m always willing to try any kind of innovation, new theory, new piece of technology because maybe it will work for my class… I’m always open to new ideas.” They felt in order to understand how the innovation works in their particular settings they would need to put it into practice themselves.

**Searching for and Selecting Innovations**

When asked about how the teachers searched for innovations, a range of techniques were described. When asked, the majority, or 19 of the 21\(^3\) (90%) teachers stated that they did not

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\(^3\) For the remainder of the document, when referencing 21 participants I refer to those who were interviewed or responded to a written questionnaire. As described in the methodology, all (45) participants completed a survey guiding through an evaluation of their assigned innovation.
receive any formal training on how to search for, select, and evaluate various resources or innovations to use in their practice. 14 of the 21 (66%) teachers mentioned that they regularly sought out resources on their own, outside of guidance from colleagues, the school or the district. Strategies for searching included turning to colleagues and the school principal for recommendations, following district recommendations or guidelines, searching a database of resources provided by the district, using Internet search engines and online tools like Twitter, Pinterest, TED Talks, the apple application store and blogs, signing up for email Listservs and memberships with professional associations, relying on advice and recommendations from local organizations specializing in the area, using resources from company vendors at the school, and attending conferences and professional development events. When asked about which technique the participant would turn to or use first, responses varied. From those in the interviews/written responses that spoke in this regard, 4 of the 21 (about 19%) teachers said they would use and take guidance from district-supported innovations over ones they found on their own. 6 of the 21 (about 26%) teachers shared that they used a combination of both searching on their own as well as guidance from district, colleague or school-supported innovations. For these teachers, a common view was that often they learned about innovations/resources from the district, colleague and school, but would make their own judgment and determination about them through their own use. For instance, in the excerpt below one teacher describes her perception of the role of the district in her classroom and how she draws from both their guidance and her own search process:

**Do you have a high level of trust for kinds of resources you are exposed to from your colleagues, district, and/or professional development?**
Yes, I do, because I feel like that’s where their niche is. My niche is in the classroom with my students and their niche is to go find research and find out what’s good and what’s not in their opinion but still vetting on my own after the fact based on what they’ve brought to the table.

**Would you trust their judgment more than your own?**
I wouldn’t necessarily say I would trust their judgment over mine. I would say trusting their judgment on bringing multiple resources to me but then going through those resources and looking for what I feel would best resonate with my practice.

**Can you talk about that more? How would you filter and select?**
So then I would obviously go online and search on what’s been done and what research been done. And TED talks I think is a really great resource to use to learn about innovations and have those individual researchers or people just walk through what they created and going through that and spending more time, definitely, searching and categorizing and seeing if they fit into my world.

Grades 2-3 Ontario, Irlen Method
In this example, the teacher describes how her district often provided her with resources, but she would ultimately make her own judgment and search for additional resources if needed. Another teacher gives a different explanation for why she searches on her own outside of the district due to the ‘half baked’ innovations the district provides with little follow-up:

I use a combination. The district passes down a lot of ideas. I personally feel a lot of the ideas are half-baked. You know, research shows this works so use this, we have a lot of things that we just touch on the surface and we never really get in depth with something that will really work or we try something for a little while but it never really works so we scrap it. I think that personally if you really want something to work you have to dedicate yourself to it. You have to focus on maybe learning one iteration and become well versed in it, have people pilot it, experiment with it within your own classroom and over a couple years not just at the beginning of the year. In the beginning of the year we decide we’re going to try this computer program, and we’re going to have this behavior plan, and we’re going to have this reading curriculum and it all just happens at once and its like ok just go do it and there’s not a lot of opportunities from the district for follow up or how’s it going or what should we change. There are a lot of things I can think of that we’ve tried in the 8 years that I’ve been in my current district that we never talk about anymore. Its not because they’re not good innovations but because in the field of education there’s always more and its just kind of cyclical, like this is something that we’ve already done before and we’re just waiting for something to come out again.

Grade 1 United States, Khan Academy

5 of the 21 (or 24%) participants who spoke in this regard strongly emphasized the important role of colleagues in sharing resources/innovations. Colleagues may be better attuned to the teachers’ particular context and students, can be considered to be more trustworthy, and are often a source of word-of-mouth sharing of resources and practices. A teacher below reflects on her use of colleagues.

Usually if I can’t find something in the school that I know is already been tried by other teachers, I feel pretty confident searching my own resources. But when we do find resources we usually bring them back to our team teachers.

Grades 5-6 English French Immersion Ontario, Edmodo

3 of the 21 (14%) stated they would turn to their own search process over district, colleague or school recommended innovations due to reasons such as feeling the district was disconnected from the working of the classroom or more current practice, for instance, and to find resources that meet their needs more effectively. A couple narratives are provided below.

I think a lot of people outside of the classroom forget what it’s like to be in the classroom. Things change; things aren’t the same as they were five or ten years ago. My situation is French immersion, and it’s a very common situation for instructional leaders, principals or the school board to say that we have to do something because it’s done that way in English. I’m thinking of
the balanced literacy program with guided reading, shared reading and that shouldn’t apply automatically to French immersion. People who have never taught French or who don’t even speak French are telling us to do things in a certain way when it’s a completely different reality. So we take what we can, like I did with invented spelling, and leave the rest to the side.

Grade 4 Ontario, Invented Spelling

Our board is really behind the times. It’s in the 1990s right now. Right now we just rolled out Google apps for education but no one really knows about it. They’re still using first class for all their web publishing; it’s so backwards. I can’t rely on that. The people we have in the board who are technology facilitators are some who have no experience using educational technology.

Grades K-8 music Ontario, Edmodo

Important to note about the search process was a lack of consistency among participants about the techniques used to narrow down and select innovations and/or resources to use. For instance, the process described to select the resources varied between the 3 private school teachers in Focus Group 1. The art teacher described how she could make a judgment on whether a resource was useful or not right away, based on her experience with what she tried with students in the past and her trust of the resource (e.g. if it came from a credible organization like the National Gallery of Art or a blog she was familiar with). A 5th grade teacher and vice principal in the group spoke about turning to the What Works Clearinghouse website to see any research on the innovation, rather than any research presented on the website itself which she viewed could be potentially biased, in addition to searching for experts or researchers supporting the innovation. The math coordinator and teacher spoke about her priority that the innovation or resource be strongly aligned with the standards (because of the cumulative nature and vertical alignment of the math curriculum); her distrust of testimonials (teachers could be paid to say them); and her strategy to search for a researcher she knew about and/or respected who validated the innovation.

Likewise, Focus Group 2 also described different search strategies; these teachers had taught in very different contexts. The teacher who had taught in Chile described his strategy as ‘primitive’ where he would search on Google and ‘click one by one’ and make a general judgment about whether or not something looked useful. The teacher who had taught in China found appeal in using websites repeatedly that had resources for multiple subjects rather than just one. The third Ontario-based teacher described turning to other teachers at the school, but always making a final judgment about the resource or innovation, editing its use in a style that matched his own, for his own needs. As he described, “We all teach in a different style. Its more the meat, and I put all the break and ingredients on it, same as online when I’m looking for a
lesson plan.” There was agreement in the group that colleagues and the district were a good way to become aware of resources, however ultimately they would make their own judgment/form their own opinion about whether or not to use something.

Below is a sampling of the responses given by the participants who were interviewed or responded in writing when asked how they would identify which innovations and/or resources to use in their search process. Each bullet outlines a different teachers’ strategy for identifying and/or narrowing down innovations to use.

- Innovations with teacher examples and an appealing lay out
- Canadian, peer-reviewed created/developed by other teachers
- A judgment call on the teacher’s ‘zone of comfort’ in implementing the innovation, anticipated engagement of the students and if it appeared to be practical/doable
- The more features, the better
- ‘Viral,’ engaging, accessible, with a culturally responsive component
- Twitter recommendations by people who the teacher followed and whose reputation the teacher trusted
- Curriculum expectations, objectives for the lesson and appear to come from a credible source e.g. a university
- Supported by evidence (especially trials in different settings) and where other teachers have used them
- Word of mouth, colleague recommendations, exposure/guidance from district, school, and/or principal

Similar to the search techniques described above, when asked about what would ultimately convince about selecting and using an innovation, a wide range of explanations were given ranging from ease of use and practicality, examples and videos of teacher use, the credibility of the founders, compatibility with prior experience, tested trials in different settings, classroom anecdotal evidence from students, relevance to the classroom lesson, and student engagement. Participants often reflected on 2-3 of these components in their responses.

**Role of Advertising and the Importance of Practicality**

When invited to share any general thoughts about their innovation (e.g. what stood out about it, why the teacher rated it the way they did) teachers reflected on a range of characteristics that caught their attention immediately, including the lay out of the webpage, their thoughts about the idea behind the innovation, their familiarity with it (whether they had heard about it from a colleague, for instance, or used a similar practice in their classroom) and specific features that drew in their attention (e.g. testimonials, videos).
Visual characteristics of the website mattered in formulating initial impressions. 12 of the 21 (or 57.1%) teachers who were interviewed or responded in writing spoke about the websites’ usability, appearance and various features offered. Several talked about the importance of the functionality and initial appearance of the website in attracting attention.

Yes it was kind of like how the resource came across to me. Just by looking at this site, the authenticity behind it. I have a critical eye towards websites and how they’re put together. It’s fine, but it’s as if it could be polished more, as if I could take it more seriously just because of its appearance.
Grades 4-5 Ontario, Brain Based Education

It’s very user friendly which is good for kids or adults or whoever is plugging into it; I don’t have to think about the interface, so that makes the learning aspect easier; I don’t have to learn a new skill to learn whatever the skills are that its broadcasting, the design aspect of that is quite functional.
Masters student Ontario with k-12 teaching experience, Khan Academy

I thought it was a really cool technique because all the students can log in to the program; the questions are all posted online and you can answer questions for kids doing homework—it is a neat thing to do/have.
Masters student Ontario with k-12 teaching experience, Edmodo

My first impression of the website was, wow, I want to get in because of the photos, the resolution, the colors, the layout.
Masters student Ontario & former teacher in Chile, Curriki

It seems interesting, and quite possibly helpful in the classroom, however the website didn’t seem very informative. The organization of the front page needs to change with the most important/informative information about the innovation in very clear and explicit language on the front page, not behind other tabs, in my opinion.
Full day kindergarten Ontario, Edmodo

These quotes reveal that a number of features on the website might influence how the teacher perceived it overall, with characteristics such as its ease of use, attractiveness and authentic appearance playing a role. Language on the website also could draw attention, particularly if related to ideas the educator was passionate about, as with a methods and resource teacher who referred to the appealing language on the website Curriki- “Yeah, the idea, the whole, ‘curriki changes lives’… the slogans and catch words they have, ‘free learning resources for the world,’ ‘changing lives,’ and ‘together we can give her the education she deserves.’” The most common response made by 16 of the 21 (or 76.2%) teachers was an expression about their hunch about the general idea behind their innovation and whether or not it made intuitive sense to them, its personal appeal.
I thought that it was an interesting innovation but I am not sure that processing issues can be ‘fixed’ by simply wearing colored glasses. These are complex issues that often require extensive testing by trained people. How can the people that are involved in this innovation be sure that they have the training and expertise to diagnose these clients?

Grade 1 teacher and literacy coach Ontario, Invented Spelling

I liked the innovation. I thought it was a great idea. I wonder if there are various similar innovations like this one already and I do not know about them due to time restraints.

Masters student teaching grades 4-8 French Ontario, Curriki

I really believe that this innovation is truthful. I was never a fan of spelling tests that were done weekly. Just last week, I was telling one of my friends who was complaining that her daughter didn’t have weekly spelling tests and I was telling her that those were not useful at all.

Grade 6 Ontario, Invented Spelling

When invited to share initial thoughts, teachers in the Irlen Method online discussion board had conflicting feelings about the innovation – on the one hand, the ease of use made it something that they could easily experiment and try out in their classroom, but there were questions about whether or not the idea made intuitive sense to them. Rather than bolstering the site’s credibility, the presence of many forms of evidence presented on the website, for 3 of the teachers in the board, made it feel like an ‘advertisement’ or ‘marketing gimmick.’

There seemed to be quite a lot of references to scientific studies on the website, including links for testimonials and research and that it has appeared on several major mass media television programs and papers. In a way then it seemed like a marketing gimmick. The over-marketing of it on the website made me wonder that this innovation must have quite a lot of critics in order to seek to justify itself so extensively. And the idea doesn't make much sense. I question whether a color overlay would really assist with a learning disability, especially one that is social/emotional or headaches, etc in nature.

Grades 2-3 United States, Irlen Method

It did seem gimmick-y. I thought that children in general, and young children in particular would enjoy using the colored lenses as a novelty, but the whole notion that it could assist students with disabilities seems far fetched.

Grade 4 United States, Irlen Method

One of the online board members described how, after reading these reviews, she re-visited the website in order to see if she could make a judgment about the innovation upon a more careful review. She found she was still ‘on the fence’ demonstrating the difficulty of attempting to discern if the innovation was credible or useful.

Following my initial thoughts I decided to go back to the website, and I spent about 30 minutes watching YouTube videos, taking the assessment, and playing with the different colored
backgrounds. I'm still on the fence. I would like to see more academic data on Irlen syndrome and why the different colors work. Why do specific combinations of color work for certain individuals? Do all people with dyslexia find relief from a specific color? I'm intrigued, but as an educator that has been in this field for nearly 20 years, I find it unusual that I have not heard of this before.

Grade 4 United States, Irlen Method

Prior experiences, reflected by 11 of the 21 (or 52.4%) teachers also played a role in formulating impressions about innovations. If it was connected to a practice the teacher used; if it was positively supported by what the teacher heard from colleagues, friends, or others; and if it seemed to match the teacher’s work environment, the innovation was considered more positively. One teacher below reflected on the resemblance the innovation invented spelling has to critical math.

The idea of invented spelling has a similar resemblance to the critical math that we are currently teaching. What I mean is that students are taught to think about their previous skill set, and using that they will, investigate a new idea. The invented spelling innovation has a similar structure in which students are encouraged to use the sound-letter connection that they already know to spell words that they might not know, and then later on, finding that link of the actual spelling and what they invented later. What stood out about the innovation is the way it can enhance the flow of writing among students. During my years of teaching junior grades, students often stop their flow of writing to figure out the spelling of words they don’t know, and breaking their momentum or idea during writing.

Grades 4-5 Ontario, Invented Spelling

Because I teach in an inner city school, we have a lot of behaviors. And I feel like behaviors are not just stemmed from within but stemmed from issues and things that kids can’t really verbalize. So trying things that don’t put them on the spot but allowing them to feel safe to be able to try and do what they want to do and I felt like maybe this could help.

Masters student Ontario & former 1-3 grades teacher in a Montessori school, Irlen Method

When invited to share any general thoughts as a first question, (e.g. what stood out about it, why the participant rated it the way they did), rarely, or only 2 of the 21 (or 9.5%) teachers, first reflected on the kinds of information (rather than organization of it) provided on the website or made reference to the evidence provided (though they would touch on this in subsequent questions) as did the learning resource teacher below. This suggests that appearance may carry more weight than the forms or kinds of evidence on the website in formulating initial impressions.

I found from a teaching point of view I valued the information provided on the site. There was enough research and qualifications mentioned for me to feel comfortable that this program has
enough supportive backing for this program to be used in a school setting (for example, not a
game or application).
Grades K-6 Learning Resource Teacher Ontario, Khan Academy

Across the innovations, teachers in the discussion forms (unlike those in the survey)
consistently emphasized practicality (feasibility of putting the innovation into practice) and
accessibility (easy to use and understand) as the two critically important qualities in determining
whether or not to use an innovation. Both focus groups spoke to the importance of these qualities
in addition to 12 of the 21 (or 57%) teachers for accessibility and 17 of the 21 (or 81%)
participants for practicality. In the survey participants are asked to list the three top qualities that
influenced their judgment about the innovation, in order. As can be seen in Table 8, accessibility
and practicality were frequently ranked as the top 3 qualities but the ratings were not strongly
different across all 6 criteria.
However, in the interviews, focus groups and written responses, being able to quickly understand and easily put to use the innovation was often a priority, as can be seen in the comments below.

As a teacher if I’m trying to choose a program to use in my class it has to be practical. If I am able to use it during or after my lesson, it doesn’t matter how good the program is, if I can’t incorporate it into my lesson, I won’t be able to use it.

Masters degree student Ontario k-12 teaching experience, Edmodo
Practicality and accessibility are the top ones because from a practical standpoint, with all of the things that go on during a day of teaching, whatever we use has to be something that will give you the most bang for your buck, that won’t have technological glitches. From a theoretical standpoint there could be some really great things, but taking it down to that every day in the classroom sort of thing, it has to be practical, it has to be easily accessible to little kids who can make all kinds of mistakes that you wouldn’t even think they could make, that was kind of my choosing to do something, that’s really where I have to start thinking… that I’m getting a lot out of this for the time I’m putting in.

Grade 1 teacher United States, Khan Academy

It’s really important. Honestly, I just don’t have the time doing a lot of that kind of stuff. Our time is very limited. We barely sleep.

Math coordinator private school Southern California, Curriki

These quotes touch on the role of theory and tested ideas- without practicality, the reasoning was that regardless how ‘good’ and well-researched an idea may be, it might not work well at a classroom level. The potential misalignment between the theory and the particular context makes the practical component of connecting the two very important. The consensus within Focus Group 1 was that evidence was important but practicality and user-friendliness were a priority. A strong emphasis and consensus with this focus group was the importance of resources or innovations being aligned with the United States Common Core curriculum and standards (e.g. searching for a standard within the Curriki website where specific resources would appear targeted to that standard). The teachers expressed they would turn to other sites like Curriki that were connected to the standards. One teacher in the focus group described regularly using a similar site called LearnZillion, which from a practical standpoint was much more functional due to the standards-aligned resources. She also knew other teachers and schools using it, however was unaware about research supporting the use of resource-sharing sites like these.

Evidence is important to me, but as a classroom teacher practicality is huge. We don’t have a lot of time to spend looking for materials and we want things that are accessible and quick that we can immediately implement in the classroom. We just don’t have the time to spend searching the Internet for lots and lots of stuff. Practicality is huge on my list on whether or not I’ll use the site and whether or not I’ll repeatedly use the site. I might use it once but after that I might not come back to it because it wasn’t very practical to me.

Grade 5 teacher and vice principal private school in Southern California, Curriki

This emphasis on practicality was similar to Focus Group 2. All 3 teachers said they found the website appealing overall due to its practical qualities, including its ease of navigation,
visual appeal and user friendliness, with an added desire to see the resources offered connected to relevant curricula standards.

It’s visually easy to follow. When you want resources, you click on the resource. When you want to learn about the website you click it. It lets you know how many members are registered, which shows how credible it is. Anytime I look for lesson plans, whether its last minute or a unit, all I need is the search bar. So for me the fact that the search bar is there is the easiest thing. For instance, I’m teaching about particle theory. It lets you know the lesson plan; it gives you different assessments; and it’s visually easy to follow. One thing I didn’t like, or maybe I wasn’t able to find, is how it links with the Ontario curriculum. For me, I’m only teaching the Ontario curriculum. I don’t know what grade its for or the curriculum expectation it would meet.

Masters degree student and former teacher Ontario, Curriki

I rank accessibility 1st, appeal 2nd, and practicality 3rd. Accessibility because as a website its very easy to navigate and search for something; appeal because its visually easy to find something quickly; and practicality because you can use it in many ways, find lesson plans easily.

Masters degree student Ontario former teacher in Chile, Curriki

There was consensus within this focus group that the practicality of the resource outweighed other considerations; evidence was irrelevant so long as the resource was easy to use and worked for them when they would try it out. This theme was mimicked in the Edmodo online discussion board. Though the teachers discussed several limitations/questions about Edmodo (equity challenges for low income schools without access to the proper technology; how it can best be used to supplement other forms of in class instruction; applicability of the program to elementary age students; etc) practicality and appeal ranked highly, as reflected below.

After seeing the results and noting that practicality and appeal ranked high among us, I think that it's because if it was hard or boring to use, then it wouldn't be as useful. The site suggested that the students would feel like they're playing, and so it helps them to work more. We also saw that it was available on mobile phones, and so that can also affect how accessible it is for some students. It also seemed that the teacher in the video had no trouble understanding how it worked.

Private School Venezuela graduate of masters program in United States, Edmodo

Based on my above response, I think I may have chosen ‘practicality’ as the most important quality given my grade level - Kindergarten. While I think the idea behind Edmodo is pretty cool, as a Kinder teacher, I am not sure that it would be the most ‘practical’ innovation, at least not during the beginning of the year! So even if evidence were a factor, given my grade level, I need to look at practicality and feasibility of the implementation first. Why bother investigating the practicality and evidence of a product that is most likely too advanced for my kiddos?

Kindergarten transitioning to 2nd Grade Teacher United States, Edmodo

These findings show that the format of presentation of the innovation or resource mattered greatly where practicality and accessibility were often emphasized as important qualities in informing overall judgments; however, the findings also show a lack of consensus
among teachers in descriptions about how to search for and select the innovations, as well as on how to apply the qualities in the evaluations.

**Research Evidence and the Evaluation of Innovations**

In table 7, above, evidence was not listed as a top issue for participants in 4 of the 7 innovations (Brain Based Education, Edmodo, Invented Spelling and Ipad in the Classroom) and the number of times evidence appeared in the top 3 was below 30% for all the innovations. When asked about where research evidence falls in comparison with the other qualities (practicality, accessibility, credibility, compatibility, appeal, practicality), the teachers described a number of reasons for not choosing research as their top quality (when not doing so) in making a judgment about whether or not to use the innovation. Evidence in the form of formal research studies or tested theories was viewed as being sometimes disconnected from the work of schools in classrooms. A tested theory could work differently at the classroom level and from one setting or year to the next, and from one child to another. The studies could have been conducted in kinds of settings very different than the setting the teacher was working in (particularly if in a specialized situation). Given the complexity of the teaching profession, the teachers reasoned it might be worthwhile to try out a practice, if it appeared to be practical and engaging for students, for instance, regardless the evidence. Take for example, a teacher who spoke about evidence in relation to practicality in her practice.

There’s a contradiction there. If evidence says it works, than it should be practical in some classrooms somewhere, but it might not be practical in my classroom. For example, perhaps this evidence was determined to work only in private schools and that’s completely different than my situation. Or maybe the evidence is given for only primary or junior grades. So I would want to go back into the research to find out. If there is real evidence that can be related to my classroom, than I would want to figure out why am I having more difficulty on the practicality side? There may be a missing piece there. However the practical side also means that I will not spend two hours dissecting if something works and there are other competing ideas as well If I don’t choose one idea than I might choose another one that’s a little easier, so the time factor is also a consideration.

Grade 4 Ontario, Invented Spelling

In this example, barriers such as time and competing ideas conflicted with the practical considerations of putting into play a practice, in addition to added concerns of research studies not addressing his particular situation. Repeatedly the teachers emphasized that with limited time, other qualities such as practicality and appeal (particularly in the assessment of whether the innovation would engage students) might hold more influence.
Other concerns about accessing and the nature of research were noted. Evidence on the innovation might be insufficient, inconclusive or unavailable. Or the evidence might be biased/skewed or come from a particular perspective or point of view. When evidence was unavailable or there was not enough time to evaluate it, 8 of the 21 (or 38.1%) teachers who spoke in this regard conceded that they would still be open to trying the innovation. As one teacher commented in relation to invented spelling, “If evidence were not available, I would still be willing to try the program out (if I was teaching primary/junior) to help students develop the writing process,” and as another teacher put it, “If it doesn’t work for everyone, it doesn’t hurt to try anything if you think that it could work.” One teacher expressed a view that research does not provide a ‘universal answer,’ and therefore the role of research was only suggestive in his practice.

I think evidence is overrated frankly just because there’s so much availability of it in education. I don’t think that there’s any one model that can be applied to everyone. If there is anything that comes through data that is universally good than it is probably pretty banal. There is still a lot that education can prove. I think the purpose of research in education is to give suggestions for teachers to add into their toolkit so that from one day to the next they can bring in a new tool. But I don’t think that anyone is going to come up with something that I never have thought of or haven’t tried before that I should be. To me that is not what the use of research is. For me the use of research is to open my horizons and to suggest new possibilities that I will try and accept if I like and not accept if I don’t like.

Grade 4 French Immersion Ontario, Invented Spelling

Like the teacher above, the teachers spoke to the experimental nature of the profession and of trying different kinds of things out, especially as it fit with perceptions of their classroom and their students. Although not asked, 4 of the 21 (19%) teachers, 1 teacher in the Edmodo discussion board and all the teachers in Focus Group 2 stated that they would need to try and test the innovation first to make a determination if it would be something that would work for their classroom; viewing the website would not be enough. As one teacher articulated, “in teaching there’s so many things we try, we have to experiment all the time; we have to see what works for this kid, what works for this kid.” In line with this thought, a k-5th grades methods and resource teacher in Ontario, talked about her willingness to try new things because it was important to her to understand and see if it would engage her kids.

They’re in my class because they’re behind; they’re low on self-esteem. They’re at that age where they’re beginning to realize that they’re quite different from their peers. They’re wondering why they’re in a class with fewer students and I get the question ‘Is this a class for stupid kids?’ a lot.
More-so than anything else I want to make sure that they’re happy and that they enjoy learning because I really believe that if they love learning, they’ll catch up somewhat. Because if I continue to plow through things they’re not liking, there’s no point; I may as well just keep them behind.

So maybe that’s why trying things out is very important in your judgment because of the engagement piece of it that you need to see.

Yes, absolutely. It makes things a lot messier though, I don’t have neat lesson plans; everything is everywhere. Things don’t last year to year; sometimes I’ll start a unit and its not working so we have to try something new again. I make sure my expectations, the overall expectations I have to teach them are there, for instance how to retell and reconnect. Like if I’m on a unit on stories, I started with a model schools unit that was given to me that I was told to try, and they just weren’t accessing it. It wasn’t written well, they weren’t getting it, so I had to get them to retell and connect doing something else. So I started reading Robert Munch because they really like humor, gross and silly humor, and that is something that they engaged with and that they were enjoying.

Grades k-5 methods and resource teacher Ontario, Curriki

The student engagement part of ‘appeal’ seemed to be articulated strongly by the teachers as an important quality to consider when choosing a resource or innovation and in trying it out. When asking about how she used resources in relation to their evidence base, the math teacher from Focus Group 1, similar to the methods and resources teacher in Ontario, highlighted student engagement as well, as reflected in the narrative below.

Would you say you frequently use things or try out things when you don’t necessarily the research behind it?

With common core, yes. I try out a lot of things to see if they work. This is the first year we are using the common core math curriculum, so its really trial and error, are kids getting the material, are they understanding the material well enough to explain it to somebody else and if not I have to reevaluate the site. And it’s also kids’ responses. If I go on a site that has a video, and they say this is so lame, this is boring, than I’m not going to use it. So it’s the student engagement piece but also your own trial and error process in the classroom. That would be more significant to you than reading a research study about the product or its effectiveness of some sort.

Yes, it would have to be engaging yet meaningful, it wouldn’t be just engaging. I can think of a site like mathsnet where they have meaningful lessons that the kids think are hysterical, so that to me is worth reading the research behind it to see if its effective to using it.

Math teacher and math coordinator, private Catholic school in southern California

While not asked about this, 7 of the 21 (33%) teachers (interviewed or who responded in writing) explicitly articulated intentionally being open to newer innovations without a strong evidence base. In addition, the teaching practice itself was reason to justify a more flexible use of resources and innovations. One learning resource teacher with five years of teaching experience, described her willingness to use products that rate higher on other qualities over evidence, because of her particular teaching style:
I would be willing to use a product rating higher in appeal and practicality over evidence because of the multi-step approach I use in teaching. Within a classroom I use a variety of resources but I would never use one exclusively to teach a concept. In implementing this program it would be done alongside direct instruction, conferencing, activities and continual assessment. I would base the evidence part on what I was seeing in the classroom. These types of studies also help to influence my selection of a resource.

Learning resource teacher k-6th grade school Ontario, Khan Academy

Focus Group 2 were in agreement that the relevancy, practicality and accessibility of the innovation mattered most; they also believed they would need to try out the innovation to make a judgment, and that research evidence, because often disconnected from the classroom, was not a necessity. Two of the teachers reflected that research evidence was important, but at a ‘higher’ level, for example, for the principal or at a district level, in justifying the promotion of innovations to the staff; another expressed the view that research could be better connected to schools.

If you came up to me and said that research shows that this website is great for new teachers and for helping you to develop your curriculum, for me I would check it out and see if it works for me. I may visit it again or I may not. I think for me research would determine on a more higher level, for instance, if an administrator went to a meeting and were told, this website and this website, we’ve done studies on teachers and they’re implementing it and using it in their classroom, we want to get this going at our school… that’s how the research would influence me, through that medium of an administrator. For myself, if I read on the website that research shows that this website is great, to me that’s what I’m reading, what research I have to question.

Masters degree student Ontario former teacher in Ontario

The relevant part of research as a teacher is if it works for me; I would use it no matter what research is supporting them (Agreement expressed within focus group). But if the research is reviewed at the board level or district level, that would be useful for them to tell their staff. But the research at a teacher-by-teacher level, I don’t care as long as it works for me.

Masters degree student Ontario former teacher in Chile

I’m saying research should be better connected. I think research is good because what it talks about is relevant to the school life, some of the methods.

Masters degree student Ontario former teacher in China

Below I share 3 brief excerpts as a summary of findings from the interview/written responses, where the teachers spoke about the weight of evidence in relation to the other qualities. In the first excerpt (mentioned by 8 of 21 or 38% of teachers); evidence was considered to be important, but not a priority or necessity in the second, (mentioned by 7 of 21 or 33.3% of teachers); the teacher emphasized the importance of context in the third (also mentioned by 7 of 21 or 33.3 % teachers), the teacher speaks to the experimental nature of the profession.
Excerpt 1: Evidence is important but not a priority or necessity
Evidence is great, in the form of formal research, how other teachers use it, how many people use it; I'm not going to say evidence is bad. If there is evidence that it works and is effective and it works for students, and teachers are saying this really works, for everybody, then that’s always a positive thin… but that wouldn’t be a requirement for me to adopt an innovation. I would like to try something to see if it works and then tell everybody else.

So you’re willing to try things that you don’t see evidence on?
Yes

So if something is shown to be not effective, you would not use it, but if there was no evidence on the website, you would make your own judgment about it.
That’s right. If there were negative evidence I would definitely not use it. But if there is no established evidence yet, like there’s so many new things, like right now how many new apps come out every single day… there’s no evidence on them yet, on how they work, how they help students… I’m willing to try them.

Grades K-8 music teacher Ontario, Edmodo

Excerpt 2: Importance of context- what works in one setting may not work in another
I thought there’s nothing there that says yes this definitely works. I guess the counter at the top talking about how educators actually used it, but I think for me I need to try something myself first in order to make a judgment; even if 10000 people are using it, if its not going to work in my practice, it doesn’t really matter, the evidence of it, does that make sense?

So it doesn’t matter what evidence is presented?
No, it matters. I think the reason I didn’t rate it in my top 3 is because what I do is very specialized. Wherever I go, I can have a bunch of people telling me it’s the best thing ever, but if it doesn’t work with what I do, it doesn’t hold a lot of weight, because my specific role is very different than what a lot of educators do.

15 years experience at a specialized elementary school for children with multiple exceptionalities Ontario, Edmodo

Excerpt 3: Experimental nature of teaching
Yes, I would be willing to use an innovation where the evidence is unavailable because schools of thought are always changing, and we, as teachers, are always evolving, or need to evolve to help children reach success. Sometimes, one teacher needs to lead the way where no one has gone before and for that, some evidence may not already be there.

Grade 6 Ontario, Invented Spelling

These excerpts also make an important point that though evidence may not have been considered to be the most important quality influencing a judgment about whether to use an innovation, research evidence was not irrelevant. In the survey, 22 of the 45 (or 48.9%) teachers ranked evidence as one of the top 3. Across the interviews/written responses, one of the most powerful forms of evidence expressed by the teachers seemed to be the ability to see practical examples of other teachers using the innovation in their classroom (in videos, for instance) and other studies that demonstrated effective use of the innovation in similar situations. When asked about kinds of research that would be most persuasive, teachers also underscored the importance
of studies that looked at large cross-sections of the population and that demonstrated that the innovation worked well in different places and times. Other important considerations highlighted the kinds of teachers involved, the length of time of the research, the cost of implementing the innovation, and specific improvements in outcomes. Evidence, conceived more broadly than research studies supporting the innovation, was considered central to their work as teachers—evidence about needs at the school, student engagement, and assessments, for instance.

Two teachers said that research evidence could be very useful in justifying a practice used to parents of the students or others. As illustrated by one educator in relation to parents, “Evidence is important to help back up and provide reason to convince parents that this innovation is beneficial to their children. Parents today grew up with the traditional rote spelling program, and to convince them that spelling the words correctly is not important might be more challenging without evidence to support;” and another in relation to administrators, “To run a ‘non-traditional’ way of teaching, teachers often face the challenge from parents or even administrators as to why we are doing this. Without sufficient evidence and credibility, it would be hard to have other parties to ‘buy-in’ to the program.”

There was a substantial minority, or 5 of the 21 (or 23.8%) teachers, for whom research evidence was the most important quality in determining whether or not to use an innovation. In their view, research evidence about effectiveness was key before trying out any practice, as reflected below.

> Everything I put into practice in my classroom is because there is strong evidence to suggest that it has been tested and proven. I don’t like to treat the students in my classroom like test subjects as they deserve and require exposure to the best teaching and learning concepts that have been proven outside my classroom by credible resources. I tend to look at what is high on John Hattie’s visible learning scale to help guide my focus for instruction in the classroom.
>
> Full Day Kindergarten Ontario, Curriki

Although only 1 teacher in the Irlen Method discussion board listed evidence as a top quality, and only two out of the five participants in the board listed it as one of their top 3, one of the teachers described re-considering her response. She reflected that a number of things would influence her decision about putting to use an innovation including imagining the device being put in her classroom (e.g. her experience that such devices tend to be more of a distraction than help with students) and her experience with similar devices; however she reflected that evidence should be ‘paramount.’
Regarding evidence, this data would seem to be the most important indicator of a successful product. The more the product is used and applied, the stronger the data will be regarding its effectiveness. I look forward to seeing more results as the "pool" grows.

If I am not respondent 3 (when providing survey responses to the participants on how they ranked the qualities in order of importance), then I wish to change my answer. Evidence provided through data collection is paramount because it is scientific proof of how successfully a device works. If I am looking to invest my time and my limited funds, I need to be sure that the product works well for my students' age group. I need to see evidence - and read reviews from those who have used it. Kindergarten United States, Irlen Method

Therefore, while a range of kinds of evidence in this study were often spoken about and considered to be important, a minority of participants described and listed research evidence as the most important quality influencing their judgments, with varying reasons given for why this was so.

**Discussion and Conclusion**

A summary of the main empirical findings of this study is as follows:

- The interview findings revealed a high receptivity and willingness to put to use the various innovations
- A majority of the teachers mentioned regularly seeking out resources on their own, outside of guidance from colleagues, the school or the district, however a wide range of strategies for searching for and selecting the innovations were described
- When invited to share general thoughts about the innovation, the teachers reflected on a range of characteristics that caught their attention immediately, including the lay out of the webpage, their thoughts about the idea behind the innovation, their familiarity with it, and specific features that drew in their attention
- Across the discussions, the teachers consistently emphasized practicality (feasibility of putting the innovation into practice) and accessibility (easy to understand and use) as the two critically important qualities in determining whether or not to use an innovation, outweighing other qualities such as evidence (these findings relate to the ratings on the qualities and how the teachers spoke about the relative importance of the qualities in relation to one another)
- Evidence in the form of formal research studies was often distrusted. Teachers described a number of reasons for not listing research as their top quality (when not doing so) including, but not limited to, that research could be disconnected from the work of schools, only apply to certain kinds of settings and be insufficient, inconclusive or unavailable

The data from this study raise several points to consider. Teachers’ openness to the innovations is interesting given the variety of kinds of innovations included in the study; while all were in wide circulation, a targeted set of practices were questionable in terms of efficacy (Brain Based Education, invented spelling, Irlen Method) and another targeted set newer and not yet
well researched (Khan Academy, iPad in the classroom, Curriki, Edmodo). The format of presentation of the innovation mattered in influencing initial impressions; this is consistent with research literature exploring educators’ preferences around formats of research presentation which shows that educators desire practical, in-the-classroom examples along with research that supports transferable practices across age ranges and contexts (Bell et al., 2004; Klinger et al., 2012; Williams & Coles, 2007). These findings suggest that if innovations or resources are strategically communicated, they will have potential for greater take-up. This finding can be used to bolster the communication of resources or innovations (via websites) we know work well but could also lead to the widespread use of ineffective practices, especially when teachers are open to trying things out. Being very receptive may translate to also being open to those practices not supported by research evidence. This can be inefficient because practices may be re-experimented with or tried in several times in different places and settings; this is a repetitious effort that takes time and has costs, especially when what has already been learned or known is not shared across systems and schools.

The results show how difficult it can be to make a quick and informed judgment about an innovation. Despite the receptivity and emphasis on practicality and accessibility as important qualities, teachers described many ways to search for and select the innovations. An inconsistent search and selection process is problematic because it suggests that there is no real basis for educators quickly finding and making informed judgments about what practices to use. This means that there would probably be little agreement on which innovations are worthwhile, or on how to make this determination. In addition, research evidence was often distrusted as a guide for assessing the innovations. With time constraints and the every day demands and complexities involved in teaching, teachers may regularly turn to resources or innovations that are attractive in several respects, e.g. are compatible with their prior experiences, are easy to implement and use quickly, with practical examples of teacher use, and that hold other appealing qualities, rather those that have research evidence supporting the practice. Several scholars have pointed out that the history of education is one of trendiness, a chronicle of many failed innovations that are often cyclical in nature, e.g. repeating the mistakes of the past or promoting ideas or things that look quite similar to ones already tried. The education industry is flooded with ideas that are promoted as new and innovative, with an abundance of innovations and/or resources available online (Carrier et al., 2014). Particularly problematic are the faddish kinds of innovations that get
adopted without much supporting evidence (e.g. see Cuban, 2004; Ravitch, 2004; Sarason, 1990; Slavin, 1999). When teachers have little background in an idea or innovation, have a preference for some qualities over evidence, are inconsistent in how they apply these qualities and have different ways for searching for and selecting the innovations, it is likely that the trendiness of re-invented practices will continue.

The findings of this study imply a very important need that is largely not addressed in teacher training programs and professional development. While school districts, local associations and others may provide and support teachers with guidance around finding innovations and/or resources, often presenting these to them, teachers often seek out resources themselves, as shown in this study, or through the recommendations of colleagues. Teachers may feel they need to ultimately make their own judgments about the resource/innovation, as many did in this study, by trying it out or exploring it further, and trust their own opinions over research evidence. Helping teachers learn about different ways to search for, but particularly to critique and apply criteria (e.g. credibility, appeal, accessibility, evidence, practicality, compatibility) in their selection process could be particularly valuable. Learning how to better evaluate research and place it within the content of the other categories would also be helpful, given teachers’ distrust of research evidence, as seen in the reasons brought forth in the follow up discussions (research as being disconnected from the work of schools; research that applies only to certain kinds of settings; insufficient, inconclusive or unavailable evidence; the complexity of the teaching profession lending it worthwhile to try out a practice, etc). Attention could be given to how to quickly find and access relevant research supporting the idea behind an innovation, such as in research syntheses or in various ‘gateways’ to research resources, organizations that provide accessible summaries and reviews of research (e.g. UK Educational Research Portal, Teacher Training Research Index see CUREE, 2007). A general caution about blind experimentation could be made, with an exploration of the potential costs for doing so. Perhaps a set of red flags cuing educators that a resource or innovation is potentially poor could be suggested, as related to kinds of research or other forms of knowledge used to support the innovation as it is represented on websites. This is complicated, however, because there is a disconnect between the kinds of knowledge teachers may find more valuable such as pedagogical knowledge, compared with kinds of knowledge produced or supported by university researchers or other organizations (McIntyre, 2005). This is reflected in how the teachers speak about the need to see other teachers
using the innovation, or the added credibility of a teacher who developed it and who is more closely aligned to every day classroom realities. Therefore, a targeted training program related to searching for, selecting and evaluating innovations could include an exploration of the role and the value of different forms of knowledge that are used to support the innovation as it is represented on websites.

Of course the sharing and systematic mobilization of tacit and practice-based knowledge between teachers in the implementation of practices is essential, to learn from one another as well as avoid repetition and waste (Miller & Pasley, 2012). Currently the education industry as a whole has a weak capacity for mobilizing and communicating various forms of research and practice-based knowledge (Hargreaves, 1996), especially as compared with other industries e.g. medicine, where the kind of experimentation seen in education would be considered dangerous and unaccepta. Despite this current reality, teachers can be trained to be ‘disciplined’ in their experimentation with newer things or things recommended to them, especially when new (or claims about being new) kinds of ideas, practices, products and services are springing up constantly (for instance, in iPad applications and other technologies).

Systems, such as districts and ministries, can also play a role in supporting or guiding teachers, not simply in providing better training around their own search and evaluation processes, but in seeking out, selecting, and providing innovations to teachers. The process of finding and selecting innovations can be a more purposeful effort of identifying important areas in need of improvement, selecting the innovations to address these areas on current research knowledge or theory, and carefully selecting innovations to assess their affects with an intent to scale up or share those that are the most promising. It may involve combining the efforts of incremental improvements with disruptive innovations and providing additional supports for teachers and others to innovate on their own in a disciplined way (Hargreaves & Shirley, 2009).

Given that the findings of this study are preliminary and with a small sample of teachers, additional research can be done to replicate the approach used (e.g. applying a set of qualities to the evaluation of a set of innovations) and see if the findings hold with larger sample sizes, teachers in different contexts, and different kinds of innovations.
Conclusion

The results of both papers point to the ambiguous and contradictory role of research evidence, both in how it influences teachers’ judgments about innovation as well as in the ways it is used in the promotion of innovations via various kinds of media. In the article on media promotion, the kinds of evidence used rarely came from formal research studies, but from anecdotal forms of evidence related to personal or others’ experiences, general statistics about problems the innovation addresses and statistics related to use of the innovation. In the article on teacher evaluation, while evidence was discussed as a low priority criterion for the teachers overall in the discussions, survey results show that none of the qualities appeared more favorably in importance across the innovations, demonstrating inconsistent assessments (and, as seen in the results, inconsistent search processes as well). It is also apparent that a wide range of strategies for the qualities evidence and credibility were used in the promotion of the innovations.

Given an inconsistent search and selection process and a distrust of research coupled with a promotion that relies less on research but on other qualities such as appeal, which qualities should matter most to teachers and why? How would one use these categories and come to best judge the innovation? If fewer examples of evidence are provided in the articles, should it be considered less important? What kinds of research evidence should matter? And how can teachers best make judgments about the innovation, for their own contexts, but also in a way that is considered consistent evaluation (using the categories to inform judgments consistently) across teachers? Should one place trust in the article or innovation website that describes several powerful personal or school-based examples of use? Or favor those that offer brief research statement summaries about the innovation’s effectiveness? Or give more credit to those that are supported by experts and well known individuals in the field? Both studies demonstrate the difficult task of seeking out and assessing various kinds of evidence supporting the innovations. Effective evaluation is made all the more difficult when a plethora of promotion strategies are used in the documents and where there is an abundant availability of innovations marketed online (Carrier et al., 2014) many that may have gained sweeping appeal, making it all the more difficult to discern those innovations that are credible from that they may be faddish, or widespread but short lived. I summarize the findings of the studies below:
Findings Summary on the Promotion of the Innovations

A wide variety of strategies were used to promote the innovations, across the six qualities. Appeal appeared most frequently for 4 of the 6 innovations, as well as overwhelmingly across all 63 documents, where the frequency of mentions was 396, a number that was more than double the second most often appeared quality credibility (183) and greater than the other qualities at 124 for evidence, 96 for practicality, 50 for accessibility and 27 for compatibility. A majority of documents used charged or descriptive language and the quality credibility appeared more frequently in newspapers. Blogs had fewer mentions of all the qualities as compared with newspapers and trade journals/magazines (with the exception of accessibility). Few of the documents reported research studies (or 8 or 13% of the documents); other evidence related strategies such as reporting statistics related to the problem the innovation addressed, quantity and kinds of users of the innovation, pilot test results, and experiences related to use of the innovation, were more often used. The total mentions of evidence for all the innovations appeared more frequently for trade journals/magazines, before newspapers and least frequently for blogs. Finally, A wide range of credibility strategies were used across the documents, including mentioning other school systems, individuals, and organizing using or implementing the approach, describing experiences with use of the innovation, citing credible sources, and others.

Findings Summary On Evaluating the Innovations

A range of characteristics of the innovation influenced initial impressions, including visual characteristics of the web site, the idea behind the innovation, their familiarity with it, and specific features that drew in attention. There was no consistent search and selection process for identifying innovations and the teachers were often open to trying out the innovations. Research evidence, though often described as important, was also often not considered a priority for teachers when forming judgments about an innovation and in the decision about whether or not to use it, where a number of reasons were described for distrust of research including inconclusive, insufficient or unavailable data; research that does not address the particular circumstances; and the experimental nature of the teaching profession. The teachers emphasized practicality and accessibility in the discussions, however the survey results also show that none of the qualities seem to dominate in importance. The majority of the teachers described regularly
seeking out innovations on their own, outside of and beyond guidance from colleagues, the school, or district.

As described above, research evidence was often not described as a priority criterion for making judgments about an innovation, and it was also cited sparingly in the documents promoting the innovations. Given the importance research evidence should have in supporting decision-making, guiding practice and as a base to policy-making (Nutley, Walter & Davies, 2007; Mitton, Adair, McKenzie, Patten & Perry, 2007), this is concerning. Many efforts have been and are being made in the education field to share various forms of knowledge; by encouraging teachers, schools and whole systems to share and collaborate in the learning process (Bryk, Gomez & Grunow, 2010); by strengthening connections between university researchers and education practitioners (Qi & Levin, 2010; Sa, Li & Faubert, 2011); by more effectively disseminating research through various intermediary organizations (Honig, 2004; Ward, House & Hamer, 2009). However, these kinds of efforts only provide partial solutions to the many challenges in inherent in an optimal knowledge translation system. It is clear, from these results, and consistent with findings from other studies on teachers’ decision making processes in selecting innovations (Doyle & Ponder, 1977; Shavelson & Stern, 1981), that other qualities time and time again influence decision making simply due to the nature of the profession, with its incredibly varied contexts, competing priorities, and everyday realities. It is not only that these other qualities, such as accessibility and practicality of the innovation, may come into play over others, such as the assessment of the research evidence supporting the innovation, but it is also the highly variable way research is perceived and used in informing judgments, that is problematic. Similarly, in the promoting of the innovations, beyond the scant mentions of research studies across the documents, a wide range of evidence-related strategies were used. On both ends, in the persuasion/promotion and in the evaluation, therefore, research evidence is not only often not regarded as the top priority but also used incredibly inconsistently. When teachers have little background in an idea or innovation, have a preference for some qualities over evidence, are inconsistent in how they apply these qualities and have different ways for searching for and selecting the innovations, it is likely that the trendiness of re-invented practices will continue.

Are these innovations being promoted in ways that are most likely to influence teachers’ judgments? In some cases, yes. In the promotion of the innovations, as noted above, we saw that
the frequency of the quality used may depend on the innovation type. For instance, the frequency of mentions of practicality for the innovation Edmodo were greater, while evidence and credibility appeared more frequently for Irlen Method and appeal for invented spelling. In the case that the document emphasizes practical features or benefits about the innovation, this would be in line with the emphasis on this quality by the teachers in the discussions. In addition, across the interviews and written responses, one of the most powerful forms of evidence expressed by the teachers seemed to be the ability to see practical examples of other teachers using the innovation in their classroom; this is an anecdotal form of evidence that was used consistently across the documents in the promotion of the innovations, where descriptions of experiences related to use of the innovation was the most often used form of evidence. Stories and anecdotal experiences may evoke strong emotions and sway views (Pulizzi, 2012; Simmons, 2006) but have a weak knowledge foundation, if any at all. Therefore, the very strategies used to more effectively persuade in the innovation promotion process—descriptive and charged language describing appeal; practical examples of use; simple and accessible language—are the qualities that may be consistent with teachers’ preferences in selecting the innovations, hence teachers may be more susceptible.

**Implications for Teachers**

An important finding in the evaluation paper was the inconsistent search and selection process between teachers; this is problematic because it suggests that there is no real basis for teachers quickly finding and making informed judgments about what practices to use and that there would be little agreement between teachers on which innovations are worthwhile, or on how to make this determination. As noted in the evaluation paper, with openness to trying out innovations, and an inconsistent search and selection process, this would likely translate to being open to those faddish kinds of innovations not supported by evidence.

In order to counter this reality, and because the majority of the teachers in the study described having no training on how to do this, teachers should have access to this kind of training—by looking at ways to more effectively and efficiently evaluate education research and exploring the role various kinds of evidence and knowledge can play in their practice; by learning about a range of strategies for searching for and finding innovations to use, particularly ways to sort through the abundance of information and ideas promoted as new and valuable innovations on the Internet and elsewhere; by learning how to find research syntheses and summaries
through databases; by finding ways to continue collaborating and sharing ideas with colleagues and other schools; and by learning ways to share what they have learned with other educators, through social media, at events, etc. Teachers can also be made more aware of the ways these innovations are likely to be promoted and to actively seek out critiques or more robust forms of evidence about the innovation before making a determination about using it or in learning more about how to better use it before attempting to implement it. Because the teachers described few formal structures supporting the search process, this may be a form of training teachers need to request by for instance collectively organizing and presenting this as an important and largely unaddressed need.

**Implications for Schools**

Leaders at schools can be made more aware of the situation teachers encounter—the increasing attention and conversation around innovation, with an abundance of resources available online free, many that are kinds of innovations that are actively promoted (such as innumerous software applications, for instance), and that teachers may be searching for and trying out on their own. Supports and training can be offered to teachers around how to manage this scenario, first in their own search and selection process, and second in providing supports around identifying needs, finding those innovations that support those needs, and working to in turn provide and distribute those innovations to teachers.

**Implications for Researchers**

Researchers who do work testing innovations can work to embed and translate their findings in ways that are consistent with the preferred qualities of teachers— for instance, by giving practical stories or case-examples of use of the innovation while illustrating a key finding in the research and by emphasizing the appeal behind and accessible features of the innovation. For the latter, these features may align well with a sound innovation (if it works well, there must be appealing features or qualities that allow for this). These guidelines are also consistent with several reports exploring teachers’ preferred formats of research presentation (e.g. CUREE, 2007; Williams & Coles, 2003). Because journal article formats often contain technical language and are formatted in ways that are appropriate to academic audiences and may be inaccessible in other ways (e.g. cost to purchase or access the article), it is important that research be re-communicated in various forms of publications (via blogs and other forms of social media,
popular articles, news articles, etc) and also discussed more frequently (events, postings, organizational websites, etc). The former is especially important as evidence in the form of formal research studies was rarely used across the document types and innovations in the media promotion study. There are a number of websites developed for teachers that offer summaries of research on a range of topics and systematically rated for their evidence support; researchers can summarize and submit their findings through these mediums (e.g. Education Endowment Toolkit http://educationendowmentfoundation.org.uk/toolkit/ supported by the Education Endowment Foundation and evidence4impact http://www.evidence4impact.org.uk/ developed at the Institute for Effective Education in the UK). Researchers can understand the complexity around and reasons given for distrusting research evidence, by the teachers, and work to mitigate these concerns, for instance, by placing the findings of the research in multiple contexts and by describing the findings within the confines of the daily reality and demands of teachers at schools. But very importantly, as one core concern expressed by teachers was biased, misrepresented or context-specific findings, researchers can work to translate their findings within a larger conversation and body of work so as not to appear as singular cases either promoting or criticizing the innovation based on a limited body of evidence provided by the study.

**Implications for Districts and Systems**

As discussed in the evaluation paper, the results of this thesis imply an important need that is largely not addressed in teacher training programs and professional development. While school districts may provide innovations to teachers, presenting these to them, teachers often seek out resources themselves, as shown in this study, or through the recommendations of colleagues. The district has a critical role, therefore, in providing the supports and training to teachers and school leaders in how to do this. Helping teachers learn about different ways to search for, but also particularly to critique and apply criteria in their selection process could be particularly valuable. Assistance with evaluating research, seeking out summaries and syntheses of research (or providing these to them), and how to place research within the content of the other qualities would also be helpful, given the teachers’ described distrust of research. A larger role may include the systematic mobilization of both research and practice based knowledge, where what is learned in the processes of experimentation of various innovations can be shared between teachers and across schools and systems, and where research knowledge on effective practice relevant to innovations can be translated to teachers, in order to increase efficiency and reduce
waste. School districts also can purposefully make efforts to identify areas that need to be improved and carefully select innovations (consistent with current research and understanding) to support those areas, with the intent to scale or spread those innovations that hold the most promise. Developing training programs to assist teachers in their own search and selection processes would be valuable.

Systems vary in terms of the level of autonomy teachers may experience in the classroom and in their ability to select and experiment with innovations; however, teaching is often considered to be a highly regulated profession in many states and systems. Reforms are crafted from this level and teachers are expected to follow through on curricular mandates and other policies. Given this, the state has an important role in the regulation of how teachers select and use innovations in their classrooms; states can help prevent the spread of ineffective but popular teaching practices, assist teachers in finding those innovations that are aligned with current research evidence and understanding, regulate the use and experimentation of innovations in classrooms and of course provide innovations for teachers to use. It would also be important for systems to communicate to teachers the legality around what kinds of innovations and how much experimentation are considered to be appropriate to that system. While there are many models one could imagine, an effective system would likely contain elements of both system regulation and teacher training around the selection and use of innovations.

The majority of the teachers in this study described independently seeking out and selecting innovations and/or resources to use in their classrooms, outside of guidance from their district or colleagues. Therefore, despite system regulation, an important implication arising from this study would be, as described above, to guide and train teachers in their search and selection processes. This has contemporary relevance in a time where social media technologies allow for an abundance of innovation to be promoted within and between teachers and where countless innovations, for instance in the form of iPad applications, web 2.0 technologies, and others, have gained widespread traction. However, as this study also shows, the relationship between research and evidence is complex. For instance, some newer innovations may not have an established research base or have controversy in terms of efficacy; research study findings may be particular to place, time, population and the way the innovation is used in the study; and research can demonstrate contradictory results. This complexity is reflected in the concerns expressed by teachers in the study around their distrust of research evidence. Indeed, as I discovered when
reviewing the research base behind the innovations selected in this study, it can be difficult to make a determination about an innovation’s overall effectiveness even when systematically searching for and reviewing the literature. Nevertheless despite this complexity, research studies over time are able to guide towards more sounds practices and away from ineffective ones. As I discussed in my review of literature on the meaning of innovation, innovations often contain overlapping and overarching ideas. For instance, Khan Academy and iPads in the classroom are forms of blended learning models that combine digital and in person instruction, and invented spelling is a constructivist approach to teaching practice. Syntheses and summaries of research can help teachers have an understanding of these overarching ideas or forms of practices behind the innovations. These syntheses may therefore assist teachers in screening out those innovations that are clearly not based on current understanding and guide them towards those that are more aligned. These syntheses would also be helpful in guiding judgment about newer kinds of innovations without an established research base specific to that innovation. The training process, as discussed above, can also focus on helping teachers find and read/evaluate research more effectively; this can be done by showing teachers how to search for research systematically and filter to those studies that apply to their context; find research summaries on ideas related to the innovation; and more quickly and effectively evaluate the findings of the research studies. Therefore, while the relationship between research evidence and innovation is complex, this does not mean that research is inapplicable or not useful; there are ways to train teachers to search for, filter and evaluate/read research studies in ways that would assist in their evaluation of the innovations.

**Next Steps For Research**

This thesis research was limited in that it included a small, non-random sample of teachers (45), however the consistency of findings, particularly across a sample of teachers from different contexts in both Canada and the United States, strengthens these results- that the majority of the teachers described having little training in finding/selecting innovations, an inconsistent search and selection process, and different ways to apply the qualities, with an emphasis on the importance practicality and accessibility in influencing impressions. Further research can be done to replicate the approach used (applying a set of qualities to the evaluation of a set of innovations) and see if the findings hold with larger sample sizes, teachers in different contents and with different kinds of innovations. The paper on the media promotion of the
innovations focused on this promotion and not on the nature of the critique process; a more thorough examination would also include media that critiques the innovations, exploring how the qualities are used in these critiques as compared with their promotion. The social media, in particular, and its various mediums, is a growing area in need of more research- while research is growing in the business literature looking at the marketing or promotion of products in this sphere and how consumers are targeted, this is an area in ripe need of further research in education.
References


Kautz, K and Larsen, E A (2000) Diffusion theory and practice: disseminating quality management and software process improvement innovations *Information Technology*


Appendices

Appendix A: Document References

Curriki

Trade Journal/Magazines


Levy, P. (2009). Curriki and the open educational resources movement: Please pass the curriculum! Multimedia & internet@schools, 16(3), 9-12.

Blogs


Newspapers


Edmodo

Trade Journal/Magazines


Holden, S. (2011). Become a Facebook fan: to reach students, use the same form of communication they use on their own. Principal Leadership, 12(1), 69-70.

**Blogs**


**Newspapers**


**Invented Spelling**

**Trade Journal/Magazines**


**Blogs**


**Newspapers**


**Brain Based Education**

**Trade Journal/Magazines**


**Blogs**


**Newspapers**


**Irlen Method**

**Trade Journal/Magazines**


**Blogs**


**Newspapers**


I can see clearly now the blur is gone. There are over 200 irlen screeners in new zealand. to find a local diagnostician go to http://irlen.com/clinicfinder.php. (April 12, 2011). *Bay of Plenty Times*, pp. B.4.


**Khan Academy**

**Trade Journal/Magazines**


**Blogs**


**Newspapers**


**iPads in the classroom**

**Trade Journal/Magazines**


**Blogs**


**Newspapers**


Educators find the iPad a useful aid in the classroom. (2011, November 3). *Targeted News Service*, p n/a.
# Appendix B: Detailed Demographic Information

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<td>2011-15</td>
<td>1, 3 and 7</td>
<td>United States</td>
<td>CA</td>
<td>San Diego Unified</td>
<td>Graduate Degree</td>
<td>Additional Qualifications</td>
<td>Other</td>
<td>Other: please specify Additional Qualifications</td>
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Appendix C: Demographic Information and Sampling Justification

Demographic Information

- 33 (73.3%) are female and 12 (26.7%) are male
- Age ranges include 16 (35.6%) between 22 and 30 years, 17 (37.8%) between 31 and 40 years, 6 (13.3%) between 41 and 50 years, 3 between 51 and 60 years (6.7%), and 3 (6.7%) 61 and older
- A range of current or most recent grade levels taught are also represented in the sample including 8 (17.8%), 9 (20%) 1st grade, 5 (11.1%) 2nd grade, 7 (15.6%) 3rd grade, 7 (15.6%) 4th grade, 5 (11.1%) 5th grade and 18 (40%) joint grade teachers. Joint grades included 1-2, 1-3, 4-5, 2-5, 5-6, instructional coach, k-8 art, k-8 music, k-5 special education, and a learning resource teacher k-6, amongst others.
- 5 (11.1%) teachers represented in the sample were not currently teaching
- 6 teachers have no additional qualifications beyond the teaching credential (13.3%)
- More than half or 23 (51.1%) of the teachers have graduate degrees and 13 (28.9%) earned a specialization, and 16 (35.6%) listed other forms of training
- The number of years the teachers have taught full and/or part time (excluding teacher training time for credential) included 6 (13.3%) for 1 year, 14 (31.1%) between 2 and 5 years, 11 between 6 and 10 years (24.4%), 6 between 11 and 15 years (13.3%), 6 between 16 and 20 years (13.3%) and 2 (4.4%) with 21 or more years teaching experience at the elementary level
- 23 (51.1%) participants were from Canada, 19 from the United States (42.2%) and 3 had most recently taught internationally (China, Chile, Venezuela) but also had experience in coursework and/or teaching in either Canada and/or the US.

Sampling Justification

This sample draws from participants in both Canada and the US. Part of this is of course for practical reasons and being able to recruit a sample in the time frame necessary to complete the study. However the teachers also describe a range of background experiences that could influence interpretations (e.g. trained in Canada but with experience working internationally and in other districts) and the questions in this study ask the teachers to consider their evaluation of the innovations excluding external constraints such as workplace conditions. When reviewing the data, it doesn’t appear that country was a more significant factor than age, gender, district, experience or other variable. The data show that the teachers’ evaluations were strongly influenced by their personal and teaching experiences and situations. Also, because the number of participants in this study is small, it is not possible to make systematic claims about a location or context. Nevertheless, the consistency of some of the findings across a group of teachers with a range of backgrounds strengthens those findings.
Appendix D: Interview Questionnaire

1. Can you provide some basic demographic information? Gender, Age, Years of Teaching experience elementary school; current school district; any additional specializations; current grade level teaching; grade levels taught and number of years for each:

2. I would like to begin by inviting any general thoughts you have about your evaluation of the innovation. Perhaps things like: what you thought about the innovation overall; what stood out to you about the innovation; why you rated it the way you did, etc.

3. Can you talk about which quality was the most important to you in influencing your overall impression of the innovation? How about your top 3? From (Compatibility, Practicality, Appeal, Credibility, Evidence, Accessibility) Why?

4. I would like to suggest an interesting result after reviewing the survey results for [the innovation]; I invite your thoughts on the questions and data below:

5. NOTE: Questions 5-8 Ask about Innovations/Resources more generally. An Innovation can be any idea, practice, approach, product or thing you use to supplement your classroom instruction:

   Do you seek out resources/innovations to use on your own in your classroom? Can you describe your search process? How do you judge and select from the ones you find, which you will actually try out and use?

6. Have you received any training around finding and evaluating or using resources/innovations to supplement your practice? Can you describe?

7. Would you trust your own judgment about an innovation more than your district and/pr school site and those that may be provided to you by them? Why or why not?

8. Finally, do you have any other thoughts/reflections you would like to share about your evaluation process or of searching for and selecting innovations and/or resources to use in your practice?
Appendix E: Survey Instrument

Evaluating Education Innovations

Greetings!

Thank you for volunteering to participate in this study titled "Innovations in Educational Reform." Your participation will help researchers better understand how educators make judgments about various educational innovations that are in wide circulation.

The following survey will guide you through an evaluation of one of these innovations. It should take no longer than 15-20 minutes.

I would like to ask that you take note of any strong or significant responses you may have about the innovation. This will assist in the follow up discussion.

Thank you again!

Informed Consent

Information and Consent to Participate: This study has been approved by the Research Ethics Board at the University of Toronto. The research will be carried out in accordance with the University of Toronto ethical standards for research. You are free to decline to answer any question or withdraw from the study at any time without consequence. All participants will be anonymous on the electronic surveys, so the researchers will be unable to identify individual responses. Participants will participate with an anonymous username in the online panel discussion. No identifying information will appear in any written report. All data will be stored electronically and anonymously and the files will be destroyed upon completion of the study. I see no potential risks to your participation in this study. Should you have any questions regarding your rights as a participant please contact: Office of Research Ethics, University of Toronto, McMurrich Building, 12 Queen's Park Crescent W, 3rd Floor, Fax 416-946-5763. If you have any questions about the research itself, please contact me (Nathalie Carrier) at nat.carrier@utoronto.ca or 858-228-6382. The full informed consent document was provided to you by email, however if you would like an additional copy forwarded to you please send me an email at nat.carrier@utoronto.ca to request a copy. Thank you!

1) Please indicate your consent to participate:*  
    [ ] Yes, I have read the above and I agree to participate.  
    [ ] No, I do not wish to participate.

Demographic Information
Please provide the following basic demographic information:

2) Gender*
   [ ] Female
   [ ] Male
   [ ] Other

3) Age in Years*
   [ ] 21 and under
   [ ] 22-30
   [ ] 31-40
   [ ] 41-50
   [ ] 51-60
   [ ] 61 +

4) Number of years you have taught grades k-5 full and/or part time (please exclude teacher training time for your credential):*
   [ ] 1
   [ ] 2-5
   [ ] 6-10
   [ ] 11-15
   [ ] 16-20
   [ ] 21 and higher

5) Grade level you currently teach:*
   [ ] k
   [ ] 1
   [ ] 2
   [ ] 3
   [ ] 4
   [ ] 5
   [ ] Joint Grade, please specify: ____________________________*

6) In what country do you currently teach?*
   [ ] United States
   [ ] Canada
   [ ] Other, please specify: ________________________________*

____________________

Additional Qualifications

7) Are you currently pursuing a postgraduate education degree?
   ( ) Yes
   ( ) No
8) Are you currently pursuing additional (non-degree) coursework to inform/supplement your teaching practice at a higher education institution (e.g. continuing education; additional qualifications; specialty certifications; etc)?
( ) Yes
( ) No

9) Please check any additional qualifications or expertise you have in the field of education:*
[ ] Graduate Degree
[ ] Specialization
[ ] No Additional Qualifications
[ ] Other, please specify: : _________________________________________________*

Innovation Links

Please take no more than 3 minutes to quickly review the following link(s) describing the innovation.

Please do not close the link windows as you may like to refer back to them in the subsequent questions.
Once you have reviewed the links, click next:

Evaluation Criteria

The following section asks you to consider a variety of qualities that may have shaped your assessment of the innovation as reflected in the link descriptions. Please assume NO external constraints (e.g. time, finances, workplace conditions, etc.) limiting your choice about whether or not to use the innovation when answering the questions.

10) Please rate the innovation on a scale of 0-10:

N/A- Not Available or Not Applicable
0- Very Low
5- Moderate
10- Very High

Compatibility: How would you rate this innovation in terms of being consistent with your prior beliefs and experiences?*

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## Consistency with Prior Beliefs

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## Consistency with Prior Experiences

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## Consistency with what peers, colleagues and friends believe

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11) Please explain your ratings on compatibility:*  
____________________________________________  
____________________________________________  
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12) Evidence - How strong is the evidence provided on the site(s) supporting the use of this innovation?  
( ) N/A ( ) 0 ( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 ( ) 6 ( ) 7 ( ) 8 ( ) 9 ( ) 10  

13) Please explain your ratings on Evidence:*  
____________________________________________  
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14) Practicality - How would you rate the feasibility of putting this innovation into practice?*  

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## Ease of Use  
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## Likely to remain useful over time  
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15) Please explain your ratings on Practicality:


16) Accessibility- How would you rate this innovation in terms of being easy to understand?

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<td>Transferability (can be used in many contexts, i.e. with different students)</td>
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17) Please explain your ratings on Accessibility:


18) Appeal- How would you rate the appeal of this innovation?

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<td>Innovation Looks Enjoyable to Use</td>
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20) Credibility- How would you rate the credibility of this innovation?*

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<td>Credibility of Developer</td>
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<td>User base (likelihood it is being used widely)</td>
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<td>Credibility of Brand (brand name, logos)</td>
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21) Please explain your ratings on Credibility:*

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Overall Impression/Judgment

Please answer the following four questions on your overall impression of/judgment about the innovation based on your 3 minute review of the link(s) describing it:

22) On a rating scale of 0-10, 0 as very low, 5 as moderate, and 10 as very high, please rate this innovation in terms of its overall value to educators:*  
( ) 0  ( ) 1  ( ) 2  ( ) 3  ( ) 4  ( ) 5  ( ) 6  ( ) 7  ( ) 8  ( ) 9  ( ) 10

23) On a rating scale of 0-10, 0 as very low, 5 as moderate, 10 as very high:

Assuming it were entirely up to you whether to use this innovation (i.e. no external constraints limiting your decision such as time, finances, workplace conditions, etc), what is the likelihood that you would use this innovation?*
( ) 0  ( ) 1  ( ) 2  ( ) 3  ( ) 4  ( ) 5  ( ) 6  ( ) 7  ( ) 8  ( ) 9  ( ) 10

24) On a rating scale of 0-10, 0 as very low, 5 as moderate, 10 as very high: How likely is this in the real world in which you currently work? *  
( ) 0  ( ) 1  ( ) 2  ( ) 3  ( ) 4  ( ) 5  ( ) 6  ( ) 7  ( ) 8  ( ) 9  ( ) 10
25) If your answers to questions 23 and 24 were different, please explain:

____________________________________________
____________________________________________
____________________________________________
____________________________________________

Importance of Qualities
Finally, I would like to conclude the survey by asking a few questions about the level of influence various qualities of the innovation had on your overall judgment of it.

26) How much did each quality influence your overall judgment of the innovation asked about in the previous three questions 22-24?

0- little influence
5- moderate influence
10- very high influence*

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<th>Quality</th>
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<td>Evidence</td>
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<td>Practicality</td>
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Compatibility: Is this innovation consistent with your prior beliefs and experiences?

Evidence: To what extent is this innovation based on quality evidence?

Practicality: How feasible would it be to put this innovation
### Questionnaire on Innovation Evaluation

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<th>Quality</th>
<th>Question</th>
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<tr>
<td>Accessibility</td>
<td>To what extent is this innovation easy to understand?</td>
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<td>Appeal</td>
<td>To what extent do you find this innovation appealing?</td>
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<td>Credibility</td>
<td>To what extent do you find this innovation credible?</td>
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</table>

27) In order of importance, please list the three most important qualities that influenced your overall judgment about the innovation (select from Compatibility, Evidence, Practicality, Accessibility, Appeal, Credibility).*

__________________________

28) Please explain why you selected these three categories:*

__________________________

__________________________

__________________________

29) Other:

Are there any other qualities that may have influenced your overall judgment about the innovation? If so, please list and describe:

__________________________

__________________________

__________________________

30) Finally, is there anything else you would like to describe more generally about your process of finding and evaluating various innovations to supplement your practice?
Thank You!

Thank you!

I very much value your participation.

I am looking forward to the follow up discussion.

If you should have any questions in the meantime, please do not hesitate to email me at nat.carrier@utoronto.ca
Appendix F: Recruitment Letter

Greetings!

I am writing to invite your participation in a study on the nature of educational innovations in education and the ways in which educators perceive, evaluate and judge them.

Increasingly innovations are circulating widely and it is difficult to know which ones will gain the interest and involvement of educators. We do not yet understand how some get the involvement of educators and why. My thesis will explore these questions.

Your Role:
As a participant in this study, you will be asked to complete a survey that will guide you through an evaluation of an innovation. The survey will take approximately 15-20 minutes to complete. Following your evaluation, you will be asked to participate in a brief follow up discussion (15-30 minutes) of your choosing (phone/skype interview, focus group or online discussion board format)

Benefits of Participation:
• Learn about several popular innovations in education
• Become more aware of the way educators come to assess and evaluate resources in the form of educational innovations for educational practice;
• Help researchers gain a better understanding of the ways in which educators evaluate various innovations
• $10 Starbucks gift card to all participants as thanks!

About the Researcher:
I am a doctoral candidate at OISE/University of Toronto pursuing this project as doctoral thesis work in the Educational Administration program.

I am more than happy to discuss the project in further detail and answer any questions you may have. Please email me at nat.carrier@utoronto.ca and we can set up a time to talk as well.

I very much appreciate and look forward to your participation in this project, Thank you!

Best regards,

Nat

Nathalie Carrier, MA/Med.
PhD Candidate Educational Administration
Department of Leadership, Higher and Adult Education
Email: nat.carrier@utoronto.ca
Twitter: nat_carrier
Phone: (647) 633 1250

Supervising Faculty: Dr. Jane Gaskell
Professor Educational Administration
OISE-University of Toronto
Email: jgaskell@oise.utoronto.ca
Phone: (416) 978-1172
Appendix G: Informed Consent

Study Title: Innovations in Educational Reform

Protocol Director: Nathalie Carrier, PhD Candidate Ontario Institute for Studies in Education, University of Toronto
Supervising Faculty: Dr. Jane Gaskell, Professor Ontario Institute for Studies in Education, University of Toronto

Greetings!

I would like to invite your participation in a research study that explores the experiences of educators as they encounter and make judgments about various educational innovations. You are being invited because you are or have experience as an elementary school teacher. Below please find relevant and important information about your rights as a participant, what your role will require, the risks/benefits associated with this study, as well as confidentiality. This study is based at the University of Toronto and will be carried out under the supervision of Professor Jane Gaskell. The data is being collected for the purposes of a PhD thesis and subsequent research articles.

Your Role:
You will be asked to complete a survey that will guide you through an evaluation of an innovation. The survey will take approximately 15-20 minutes to complete. Following your evaluation, you will be asked to participate in one of three options of your choosing:

a. To participate in a 15-30 minute follow up interview (by phone or in person) where you will be asked about your evaluation and rating process
b. To participate as a panelist in an anonymous online discussion board that will focus on a discussion about reasons behind/differences between survey ratings of the innovation (3 weeks with a minimum of 2 log-ins to the board of an estimated 5 minutes each)
c. To participate in a focus group with other elementary school teachers that will also focus on a discussion about reasons behind/differences between survey ratings of the innovation (30-45 minutes)

You may withdraw from the study at any time without consequence, penalty or judgment.

Risks and Benefits
There are no significant risks in the study. Participants at no time will be judged or evaluated and at no time will be at risk of harm.

The benefits, which may reasonably be expected, include the following:

- You will learn about several popular innovations in education
- You will become more aware of the way educators come to assess and evaluate resources in the form of educational innovations for educational practice;
- You will help researchers gain a better understanding of the ways in which educators evaluate various innovations.
- You will be offered a $10 Starbucks gift card as thanks.

Your decision whether or not to participate in this study will not affect your employment.

**Payments**
Participants will be offered $10 Starbucks gift cards as thanks for their participation in the study.

**Subjects Rights**
If you have read this form and have decided to participate in this project, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. You have the right to refuse to answer particular questions.

No identifying information will be included in the results of this study.

**Access to Information, Confidentiality and Publication**
Only the protocol director (myself) and the supervising faculty (Dr. Jane Gaskell) will have access to the data in this study. Participants will remain anonymous from each other in this study and all data collected (panel discussion and survey responses) will be stored in a password-protected space.

The researcher intends to publish and present this work. You can have access to the final report, which will be located in the OISE/UT thesis collection and which can be accessed electronically in the University of Toronto Research Repository (T Space) at https://tspace.library.utoronto.ca/handle/1807/9944. Participants may also request a copy of the research findings by contacting the researcher directly.

Data from this project will be retained for the duration of the researcher’s PhD program and kept in a password protected computer space. The researcher would like to keep the data for an indefinite amount of time for future research studies that build on the project and provide useful comparisons with the data.

**Contact Information and Questions:** If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, please contact the Protocol Director, Nathalie Carrier at nat.cARRIER@utoronto.ca or (647) 633 1250, or Dr. Jane Gaskell at jgaskell@oise.utoronto.ca or (416) 978-1172.

**Audio Recording of Interviews**
If you decide to do a focus or interview, I will seek your permission for recording to ensure the quality and accuracy of responses to questions. Audio recording in this study is voluntary and available only to the interviewer. No additional copies of tapes will be made and copies will be secured by the investigator.

**Independent Contact:** If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the University of Toronto Office of Research Ethics at ethics.review@utoronto.ca or 416-946-3273.
Thank you in advance for your participation.

__________________________________________________________________

I give consent to be audio-taped during this study.

Please initial: ___Yes ___No

I have read and understood the information provided in this study. I understand that Nathalie Carrier, and Faculty Adviser Jane Gaskell, agree to answer any questions I have regarding the study. If you agree to participate in this research, please either sign below or email the form back to the investigator. Please also include a statement that you consent to participate in this research in the written text of your email back to the researcher.

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<th>Date</th>
<th>Printed Name</th>
<th>Signature</th>
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</table>

Protocol Director:
Nathalie Carrier

Nathalie Carrier, MA/Med.
PhD Candidate Educational Administration
Department of Leadership, Higher and Adult Education
Ontario Institute for Studies in Education
University of Toronto
252 Bloor Street West
Toronto, Ontario
M5S 1V6
Email: nat.carrier@utoronto.ca
Twitter: nat_carrier
Phone: (647) 633 1250

Supervising Faculty: Dr. Jane Gaskell
Professor of Education Administration
Department of Leadership, Higher and Adult Education
Ontario Institute for Studies in Education
University of Toronto
252 Bloor Street West
Toronto, Ontario
M5S 1V6
Email: jgasekell@oise.utoronto.ca
Phone: (416) 978- 1172

PLEASE PRINT OR SAVE A COPY OF THIS LETTER FOR YOUR RECORDS