*AERA 2008 – Division K: Teaching and Teacher Education*

# Preparing Teachers as Agents of Change:
# The Role of Entrepreneurial Concepts and Practices

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**Abstract**

This paper explores how entrepreneurship – broadly defined as "transforming ideas into enterprises that generate economic, intellectual and/or social value" – can contribute to teacher preparation, building on the literature on entrepreneurship education and a series of case-studies of "entrepreneurial educators." Arguing that teachers assuming civic responsibility are de-facto "agents of change" who undertake innovations to the benefit of their students, school and community, it is suggested that the field of entrepreneurship can offer new ideas to prepare teachers to better fulfill this responsibility. Specific entrepreneurial concepts and practices that seem especially relevant for teachers are identified, along with concrete suggestions about how they could be included in teacher preparation programs and in-service professional development initiatives.

## Introduction

Teachers are increasingly recognizing the need to become "agents of change" in order to better meet the needs of the students, families and communities they serve and, thus, fulfill society's expectations about educators' civic responsibility – the overall theme of this 2008 AERA Annual Meeting. With public education facing increasing problems – as, for example, literacy remains an unattained goals for too many students, even our best students struggle to acquire the scientific and specialized knowledge required to be competitive in today's world, and achievement gaps across different groups continue to widen – it is clear that any teacher committed to excellence and equity in education cannot accept the status quo.

Recognizing that radical changes are needed in order to improve education is an important first step, but it is not enough. We also need teachers who are willing and capable to lead such changes by being able to both identify worthwhile opportunities for innovation and carry them out successfully. Yet teachers usually receive little formal preparation to help them engage effectively in these activities. This paper draws from the field of entrepreneurship to suggest new ideas and approaches to address this need.

Connections between entrepreneurship and education are just beginning to be recognized in the literature, as documented in a recent literature review on entrepreneurship in education presented at a previous AERA meeting (see Rios-Aguillar, Khan, & Borasi, 2006). Some of the studies identified in this literature review have begun to make connections between entrepreneurship and education at the conceptual level (Brown & Cornwall, 2000; Hentschke & Caldwell, 2005; Hess, 2006). Others have provided images of what it means to be entrepreneurial in the field of education, and the benefits that can be derived by doing so, by reporting the story of individuals who have been entrepreneurial in the field of education (Fisher & Koch, 2004; Leisey & Lavaroni, 2000). Only a few are empirical research studies attempting to study specific aspects of entrepreneurship, and they have mostly focused on educational leaders rather than teachers (Borasi & Ames, 2007; Eyal & Kark, 2004; Hill, 2003).

Only two studies we are aware of involve the study of “entrepreneurial” teachers (Kolderie, 2003; Vitagliano & Khan, 2007) and another one (Gouws, 2002) has developed concrete suggestions in terms of including entrepreneurship education in teacher preparation programs – although focusing only on enabling teachers to teach entrepreneurship (interpreted narrowly as starting new businesses) to K-12 students in South Africa. Thus, this paper fills a gap in the current literature by specifically addressing how teachers could use entrepreneurial skills, attitudes and processes to become more effective in initiating worthwhile innovations and, as a result, add value to their organizations and the services provided to their students, families, and broader communities.

Building on both the existing literature on entrepreneurship education and a series of case-studies of entrepreneurial educators conducted by a research team led by the author, this paper identifies a number of specific concepts and practices considered typical of entrepreneurs that seem particularly relevant for teachers aiming to become effective agents of change. Concrete ideas about how prospective and in-service teachers could learn about these entrepreneurial concepts and skills most effectively are also suggested.

## Theoretical framework and relevant literature

To appreciate the potential contributions of entrepreneurship to education, and the preparation of teachers more specifically, it is important first of all to challenge the common perception that entrepreneurship is the equivalent of “starting a new business” and aims essentially at the generation of economic returns. On the contrary, there is considerable support

in the current literature for conceiving of entrepreneurship more broadly as a process that involves all the functions, activities, and actions associated with recognizing opportunities and taking concrete actions to implement new ideas (Timmons, 2004). Most recently, the emerging field of *social entrepreneurship*, defined as the creation of organizations and initiatives that work to address social problems (Bornstein, 2004; Leadbeater, 1997; Theobold, 1987), has also shown how the application of entrepreneurial concepts and processes is relevant to those who wish to create positive social change.

While there is no agreed-upon definition of entrepreneurship (Bygrave & Hofer, 1991), the alternative definitions listed in Figure 1 can help us identify some key elements of entrepreneurship and their relevance for teachers and teacher preparation.

**Figure 1. Alternative definition of entrepreneurship in the literature.**

*Entrepreneurship is:*

1. Pursuing and carrying out innovations *(Shumpeter, 1934)*
2. Perceiving an opportunity and creating an organization to pursue it *(Bygrave, 2004)*
3. A process by which individuals — either on their own or inside organizations— pursue opportunities without regard to the resources they currently control *(Stevenson & Jarillo, 1990)*
4. Transforming ideas into enterprises that generate economic, intellectual and social value *(Green, 2005)*

First of all, it is significant that one of the pioneers of entrepreneurship, economist Shumpeter (1934), described entrepreneurship in terms of "pursuing and carrying out innovations." When we think of teachers who have been successful agents of change, indeed initiating innovations is at the core of their activity. Bygraves and Stevenson & Jarillo's definitions bring to our attention the key role played by recognizing and pursuing <u>opportunities</u> – another element that characterizes the activity of agents of change in education as well as any other field. Stevenson & Jarillo's definition also points to an attitude that seems critical to the success of entrepreneurs and agents of change in all fields – that is, recognizing that the limitation of <u>existing</u> resources should not unduly constrain the decision to embark in a new worthwhile venture; rather, one should be prepared to look for different sources of revenues to start such ventures. This realization may be especially important for teachers, as they rarely control resources in their own institution. Finally, Green's definition makes explicit that

entrepreneurial concepts and processes can be applied to a service-centered arena such as education, while recognizing that the end goal in this case may be different – as business entrepreneurs tend to focus on generating economic value, while teachers and other educators will aim first and foremost at generating social and/or intellectual value.

It is also worth noting that, while early research on entrepreneurship studied either the traits/characteristics of entrepreneurs (Brockhaus, 1982; McClelland & Winter, 1969) or the contextual factors affecting entrepreneurial activity (; Casson, 1982; Kirzner,1979; Schumpeter, 1934), more recent studies on entrepreneurship have challenged this artificial dichotomy to offer a more comprehensive approach to study entrepreneurship, one that focuses on entrepreneurship as a *process* – that is, the development of new enterprises or initiatives that "add value" (Baron & Shane, 2005; Timmons, 2004). A focus on the process that takes place as teachers initiate and carry out specific innovations has also characterized this study. More specifically, using a model of the entrepreneurial process adapted from the one proposed by Baron & Shane, we will be looking at the attitudes, skills and practices that "entrepreneurial teachers" may use to successfully enact each of the key components of the process of initiating an innovation, as identified in Figure 2.

**Figure 2. The entrepreneurial process.**

***Key steps involved in initiating an innovation:***

*a) Coming up with ideas for worthwhile initiatives.*
*b) Evaluating whether the idea is worth pursuing.*
*c) Making detailed plans for the initiative.*
*d) Gathering the necessary resources to launch the initiative.*
*e) Implementing and monitoring the initiative.*
*f) Ensuring long-term sustainability/ growth.*

Identifying specific elements within the entrepreneurial process can be very helpful to recognize what it takes for a teacher to be successful in coming up with and carrying out a specific project or enterprise. At the same time, it is important to note that this is not a rigid sequential model – that is, some of these "stages" can overlap and be repeated depending on the specific innovation and context. For example, sometimes it may be difficult to distinguish the <u>recognition</u> from the <u>evaluation</u> of an opportunity, or the evaluation of the original idea may

occur as an integral part of developing the plan, or one's plan may include as a critical component how to come up with the necessary resources and/or measures to ensure long-term sustainability need to some extent to be included as part of the initial plan.

**Mode of inquiry**

Once we recognize the potential contributions that entrepreneurship more broadly conceived can offer educators, and teachers more specifically, a number of interesting questions arise. This exploratory study was informed by the following research questions:

- *What kinds of innovations may teachers initiate and what "value added" could these innovations produce?*
- *Which entrepreneurial concepts and practices could support teachers' implementation of a specific innovation?*
- *How could teachers best learn these entrepreneurial concepts and practices?*

To address these questions, the author examined and synthesized findings from (a) a systematic literature review on entrepreneurship and entrepreneurship in education, (b) a series of case-studies of entrepreneurial educators, and (c) the implementation of a few learning experiences on entrepreneurship for pre-service and in-service teachers that took place in the content of university courses.

The literature review (summarized in Rios et al., 2006) included texts addressing entrepreneurship in a variety of disciplines, including economics (Schumpeter, 1934; Casson, 1982), business (Bygrave & Zacharakis, 2004), psychology (Brockhaus, 1982), sociology (Thorton, 1999), and education (Boyette & Finlay, 1993; Brown & Cornwall, 2000; Leisey & Lavaroni, 2000; Hill, 2003; Hentschke & Caldwell, 2005; Hess, 2006). Texts were located by conducting electronic searches combined with consulting with experts on entrepreneurship in the various fields to identify the most significant texts in that field.

The case-studies of entrepreneurial educators were conducted by a research team led by the author as part of a larger study funded by the Kauffman Foundation. The case-study subjects included a principal, an assistant superintendent for instruction, a university dean, the CEO of a not-for-profit organization, the CEO of a for-profit education-based company and, most importantly for this paper, a teacher. All these individuals were selected because of their record of successfully implementing worthwhile innovations in education. The teacher, Lynn Gatto, is a veteran elementary school teacher who has shown remarkableble resourcefulness and

determination in providing her urban students with the learning experiences they need to "level the playing field" and be successful in both school and life – as recognized by prestigious awards such as 2004 New York Teacher of the Year and 2006 Disney Teacher, and demonstrated in the video-documentary, *The Life Outside* (Smith, Larson & Gatto, 2005), featuring one year in her classroom. Her innovative initiatives have spanned from creating innovative curriculum units to organizing (and funding!) field trips to other parts of the country to enable her students (many of whom had never been outside of Rochester) to broaden their experiences – despite the challenges presented by limited funding and the bureaucracy of a large urban school district.

For each of the case-study subjects, a series of interviews (four with the subject and others with collaborators) were conducted and complemented by the analysis of artifacts. All interviews were guided by detailed protocols to ensure consistency across case-studies, and included questions about how specific innovations were initiated and carried out, as well as more general questions about each subject's professional history and practice. Data collected from interviews and artifacts were coded using a pre-determined coding scheme developed by the research team (which included, among other things, the six stages of the entrepreneurial process identified in Figure 2) and entered into N6 (a qualitative analysis software program) to facilitate its analysis and reporting. A case-study database, informed by the same coding scheme, was then created for each subject A final "member-check" was conducted with each subject to ensure accuracy of information and interpretations.

The author also capitalized on her personal experience designing and teaching two graduate courses – *Entrepreneurial Skills for Educators* and *Grant-writing and Other Funding Strategies for Educators* – which enrolled a wide audience of professional educators, including in-service teachers, as well as a 5-hour "module" offered within another course (entitled *Topics in Teaching and Schooling),* required of all pre-service teachers.

**Key Findings**

Before reporting findings related to the research questions informing the study, I would like to briefly describe a few of the innovations Lynn Gatto undertook in her successful career and how she engaged in them, as an "anchor" for the more general observations that will follow.

*a) Producing NYS-shaped cookie cutters.* Early in her career, Gatto applied for and secured a $1,000 grant to produce large "New York State-shaped" cookie cutters that elementary students could decorate like a map and use to learn about geographical features of their state.

Together with her 4th grade students she also wrote and produced a teacher guide suggesting learning activities to do with the cookie cutters, which they quite successfully sold (along with the cookie cutters) to teachers across the state. As part of this process she took her class through some of the key steps required to create a company to produce and sell the cookie cutters – thus transforming this activity into an integrated unit addressing literacy, mathematics, geography and business. The idea for this project first came to her as she read an article about decorating cookies in the shape of a state, but then she could not find any cookie cutter big enough to carry out the suggested activities. This project required Gatto to forge a new partnership with a local high school technology teacher and his students; as she was looking for how to produce the cookie cutters, she identified which high schools in her district had the needed equipment and did not hesitate calling the technology teacher in one of these schools and suggesting that they collaborated in this project.

b) *Giving urban elementary students access to the world through video-conferencing.* As Gatto learned about the possibility of doing video conferences, she immediately recognized the potential that this technology could have to connect her urban students with students in different parts of the United States. She was particularly interested in having her students do video conferences with a class in Kentucky, as later in the year she was planning to take her students in a field trip to Kentucky to visit this class. Unfortunately, her elementary school did not have nor could afford this technology; undeterred by this obstacle, Gatto identified a facility for video-conferencing in a near-by high school and arranged to walk with her students to that school in order to use it on a regular basis.

c) *Taking her 4th grade class on a field trip to Kentucky.* As a culminating experience for the 4th grade class she had worked with for the previous three years, Gatto organized a 4-day trip to Kentucky to visit a colleague's class (the same class her students had developed a long-term relationship through video-conferencing throughout the year). Arranging this trip involved considerable planning, from getting the necessary permissions and organizing worthwhile activities during their visit to Kentucky, to acquiring the necessary plane tickets and arranging for affordable night accommodations. As most of her students could not have afforded to pay for such a trip, Gatto convinced some friends to donate frequent-flier miles, did fund-raising with her students, and she managed not to spend any money for accommodations as she was able to arrange for them to sleep in the Kentucky school gym

and in some of the Kentucky students' home. She and her principal also took some considerable risk in pursuing this event, as after the tragic events of September 11 (which happened in earlier in the same school year) her district put some moratorium on field trips. All this was worth it, however, as this trip turned out to be the experience of a life time for many of her students.

d) *Publishing science curriculum materials for elementary teachers.* A chance meeting at a conference led Gatto to take on the opportunity offered by a publishing company to create curriculum materials that would allow other elementary teachers to engage students in meaning science learning and meet the prescribed science standards by replicating many of her successful science lessons while. This initiative required a considerable amount of time and effort, as preparing the materials alone took more than a year and a half, and she also agreed to provide presentations and training to enable other teachers across the country to best use these materials; at the same time, this was well worth it, considering that it allowed children across the country to benefit from this exceptional teacher's ideas and experience – and in this case even created some economic value for the teacher as well as the publishing company!

e) *Developing a videotape for parents about learning disabilities.* One of Gatto's early initiatives, over 20 years ago, was to apply for and secure a small grant that enabled her to prepare a video for parents of students with learning disabilities, explaining about the nature of the most common learning disabilities and their implications on their child's behavior and opportunities to learn. As she was working with special education students at the time, Gatto had come to realize that many parents did not really understand the nature and implication of the learning disabilities affecting their child, and she felt that in order to effectively support her students' learning and development she needed to go outside of the classroom and reach to their parents. Although she did not know much about making videos, she used her network to locate a capable local videographer and used the grant funds to pay this videographer to create a video under her direction.

***What kinds of innovations may teachers initiate and what "value added" could these innovations produce?***

The examples reported above show that there are many different types of initiatives that teachers may develop to the benefit of their students, schools and communities. Generalizing

and expanding from these examples, the following complementary types of innovations can be identified:

- *Organizing special activities for one's students:* Innovative teachers can greatly contribute to their students' learning and growth by organizing activities that go beyond the basic expectations of "teaching the assigned curriculum" – like the trip to Kentucky and other field trips that Gatto organizes every year for her class of urban 2$^{nd}$-4$^{th}$ graders, many of whom have never gone outside of the city. It is interesting to note that these special activities are usually a one-time event, not necessarily replicable or "sustainable" – yet they represent worthwhile innovations that can add value to the each student in the class, by contributing in unique ways to their development as informed human beings and citizens.
- *Adopting new practices/ approaches:* Teachers can also add value to their students' learning experience whenever they adopt a new practice that can increase their effectiveness as teachers and/or their students' access to valuable resources – as illustrated by Gatto's use of video conferencing. In contrast with the previous type of innovation, changes in a teacher's practice – if deemed effective – have the potential to be sustained over time and thus affect more than the students in just one class. Having learned about video-conferencing and having set up a system to have access to this technology with a particular class was something that Gatto could bring to the next classes of students she served.
- *Implementing curricular innovations:* Innovative teachers also continuously create and/or implement new lessons and units in the effort to increase the learning opportunities offered to students – as illustrated in Gatto's case by the integrated unit she developed around the production of the NYS-shaped cookie cutters. It is easy to see how these curricular innovations can greatly add value to the learning and growth of the students' in the teacher's own classroom. Depending on how easily they can be adapted and repeated with other classes, curricular innovations can remain a one-time event or become part of a teacher's repertoire.
- *Disseminating curricular innovations:* The value of any curricular innovation can be multiplied whenever it is adopted by other teachers as well, to the benefits of students in their classes. Thus, teachers can act as agents of change even beyond their classroom when they take on the responsibility and initiative to disseminate a curricular innovation they have implemented successfully – whether it was their own creation or not. This can take many

different forms – such as presenting on their successful experiences to colleagues in the same school or district, presenting at professional conferences, publishing articles, or even collaborating with a publishing company to produce certain curricular materials (as Gatto did).

- *Initiating projects and/or grass-root organizations in the community:* Teachers' engagement in innovations that add value does not need to be limited to curriculum and instruction. Teachers can also be leaders in affecting changes in the community that in turn may greatly affect the well-being of their students and, thus, what goes on in their classrooms. Gatto's creation of a video on learning disabilities for parent in an example. Other teachers have also been instrumental in starting movements and/or grass organizations in their community with the aim of addressing some of the many factors that may affect students' behavior and success in school.

As even just the few examples we have reported illustrate, successfully initiating any of these different kinds of innovations is likely to be challenging, and presents many parallels with what it takes to initiate a new venture or business.

***Which entrepreneurial concepts and practices could support teachers' implementation of a specific innovation?***

The business literature (Barron & Shane, 2005; Timmons, 2004) has suggested that entrepreneurs can benefit from an awareness of the key steps involved in the entrepreneurial process and from learning specific skills that may be useful at specific stages of this process. Similarly, teachers could benefit first of all from recognizing that the development of an innovation involves the steps identified earlier in Figure 2, and also from being introduced to specific practices and skills that other entrepreneurial educators have used effectively within each component – as discussed below. Readers can find some specific examples based on Gatto's case-study in the figures that follow the narrative text of each section.

1. *Coming up with ideas for worthwhile initiatives:* The first critical step in initiating an innovation is obviously coming up with the initial idea for a possible project, initiative or a sustainable enterprise that has the potential to benefit one's students, school and/or community. This, in turn, requires that the teacher identifies unmet needs (of the students, school and/or community) as well as possible new solutions to address those needs – either by recognizing and being able to capitalize on opportunities that may present themselves, or

by pro-actively seeking such opportunities. There are a number of strategies that the entrepreneurial educators studied used successfully at this initial stage of the entrepreneurial process, and that teachers could benefit from, including:

- Listening to and observing one's students, with the explicit goal of recognizing unmet needs.
- Reflecting on one's own innovative practice to recognize students' and teachers' unmet needs, as well as areas of one's practice needing improvement.
- "Scanning the environment" for new ways to teach and support students' learning; this could include looking at innovative curriculum materials, reading about relevant research, going to conferences, participating in professional development, observing colleagues who are 'master teachers', etc.
- Soliciting and listening to other people ideas for improvement – whether they are colleagues, parents, or even the students themselves.

**Figure 3. Illustration of selected strategies to "*Come up with ideas for worthwhile initiatives.*"**

- *Listening to and observing one's students*: Both the idea of using vide-conferencing and the Kentucky field trip came from Gatto's recognition that her students needed experiences outside of their city to gain cultural capital most urban students lack.
- *Reflecting on one's own innovative practice*: The impetus to produce and sell New York State Cookie Cutters came from Gatto's own frustration as she could not find a big enough cookie cutter in the shape of New York State to do what she wanted in her lesson; a main drive behind publishing elementary science curriculum materials was that she had never had such materials available to support her lessons.
- *Scanning the environment:* Gatto got many of her instructional idea from conferences and professional journals (even if she would often adapt and expand them considerably – as demonstrated by the Cookie Cutter initiative).

2. *Evaluating whether the idea is worth pursuing:* As most teachers have more ideas for innovations than they can possibly pursue in their lifetime (let alone in a specific school year!), deciding which of these ideas are worth pursuing is most critical. While most of the entrepreneurial educators interviewed reported engaging in this decision-making process in an informal and intuitive way, rather than following a systematic approach, their practices uncovered the following strategies:

- Using one's vision as a "filter": For all the case-study subjects, the most determining factor in deciding whether or not to pursue a specific innovation was usually the extent to which this innovation would allow the educator to pursue his/her vision and mission. If the answer was positive, the question became not so much whether one should initiate that innovation, but rather how and when one could do that successfully.
- Not letting lack of resources be a deterrent: Another element that characterized the practice of all the entrepreneurial educators studied was that lack of resources never stop them from initiating an innovation they believed would make a difference for the clients they served. This does not mean that any of them was naïve about the need to eventually secure sufficient resources; rather, it meant that they made the decision about moving forward with an innovation even before having been able to secure those resources, and furthermore they had the confidence that (if the idea was good enough) they would be able to eventually find the needed resources – very much in the spirit of Stevenson's definition of entrepreneurship included in Figure 1.
- Evaluating risk based on one's knowledge and experience: How many teachers would be willing to take on the risk of taking more than 20 4th graders in a 4-day field trip, especially soon after the events of September 11? Yet Gatto did not hesitate doing so. Recognizing that every innovation involves some risk, the question becomes if and under what circumstances such a risk is worth taking. Answering this question is not just an "objective" matter of evaluating and balancing costs and benefits; rather, each teacher may come to a different conclusion depending on her knowledge of the situation, her past experiences, her confidence about what she can handle, the ways to minimize risk she can conceive and, most importantly, her personal goals and values.

These observations, when taken together, also suggest that less experienced "innovative teachers" may benefit from training and tools that could help them do a more systematic and comprehensive analysis of the "costs/risks" as well as "benefits" involved in a specific innovation, as well as articulate their vision.

**Figure 4. Illustration of selected strategies to "*Evaluate whether an idea is worth pursuing.*"**

- *Using one's vision as a "filter"*: For Gatto, the critical question was always: "Will this innovation help level the playing field for my students in a significant way?"

- *Not letting lack of resources be a deterrent*: Gatto committed herself to make the Kentucky field-trip a reality long before she had figured out how to pay for the students' plane tickets, how to arrange cheap yet safe accommodations for her students for their 4-day stay, how she would get all the official permissions, etc.
- *Evaluating risk based on one's knowledge and experience*: Gatto's confidence that she could handle the Kentucky field trip was shaped by her previous experiences with this group of students (most of whom had been in her class for the past three years), her relationship with their parents, her trust in the organizational ability of her partner teacher in Kentucky as well as her own organizational skills. She also took some concrete steps to minimize the risks she was aware of whenever possible – for example, by enlisting the help of a few parents/guardians as chaperones during the trip, and precluding the participation of a student whose behavior she felt could create problems.

3. *Making detailed plans for the initiative:* We know that careful planning is a critical element for the success of any initiative; we know much less, though, about the kind of planning and the level of detail that innovative teachers need to engage in – especially when taking into consideration that time and resources are always limited. Looking at Gatto's as well as other entrepreneurial educators' planning practices we noticed the following practices:
   - Approaching the planning of an innovation as a "lesson plan": There are a lot of parallels between planning an innovation and planning an instructional unit, so teachers can capitalize on their lesson planning skills and experience at this stage of initiating an innovation. Among other things, it is important to identify in advance the many details that can make or break the implementation, take into consideration what one knows about the various players and their possible reactions, consider and play out different possible scenarios, and continually question if the activities planned truly match one's goals. And, just as it is the case with lesson plans, while it is important to work out in one's mind all the possible scenarios and details, the extent to which these things have to be written down depends a lot on each teacher's experience and style.
   - Writing formal plans only when needed for external audiences: It is important to realize that a formal written plan is usually needed only when one needs approval or seeks external funding for a specific innovation. In this case, it is important to understand what the external audience requires and produce a document that meets their needs. Paradoxically, writing a formal plan may in many cases impede one's progress in initiating an innovation, by taking precious time and resources away from other stages of the process.

**Figure 5. Illustration of selected strategies to "*Make detailed plans.*"**

- Writing formal plans only when needed for external audiences: Gatto reported writing formal plans almost only when she applied for a grant. When writing a grant proposal, she felt it was very important to give the reader a clear sense of the product that would result from their funding and the value it would provide.

4. *Gathering the necessary resources to launch the initiative:* While the availability of resources is rarely a deterrent in the decision of whether to undertake a worthwhile innovation, before that innovation can be successfully launched, one needs to ensure that the funding, personnel, facilities, and any other kind of needed resources, are indeed available. Each type of resource presents unique challenges and opportunities for teachers (who usually do not have control of fiscal resources nor human capital resources within their organizations). Looking at Gatto's and other entrepreneurial educators' practices at this critical stage suggests the following strategies:
   - Using volunteers: Because teachers usually cannot hire or utilize other staff members for their projects, the innovations they can engage in are often limited to what they can accomplish on their own, with at best the help of volunteers. Therefore, teachers need to learn how to creatively and effectively find and utilize volunteers. In addition to students' families and personal friends, it is also worth considering community members and organizations, elders living in the community, and even student teachers.
   - Bootstrapping: As teachers rarely control resources besides their own time, the success of their innovations often impinges on being able to get access to "free" materials, equipments, experts, etc.
   - Developing and capitalizing on social capital and networking: A teacher's ability to implement innovations that require more than her/his own efforts – and even in many cases to effectively bootstrap! – depends in large measure on how wide her/his network of contacts is and how willing s/he is to "ask for favors." Interestingly, the ability to develop and capitalize on one's social capital, combined with the skill of effectively "sell" one's vision, seems to be a characteristic shared by most entrepreneurs – both in the business and social arenas.
   - Tapping into internal funding sources: While teachers do not have direct control to any financial or human resources in their institutions, the innovations they are after may often

meet mandates or priorities that can be funded internally – for example, through already established funds for professional development, curriculum materials, etc. Learning about available funding opportunities and how they can be tapped for specific projects is therefore an important skills for innovative teachers to develop.

- Seeking grants: While too few teachers take advantage of this, there are a number of grants and other funding opportunities teachers can capitalize on to fund their innovations. Some of these grants are targeted specifically to individual teachers, other grants could be applied to by the school or district, or be accessible through partnership with universities or other community agencies. Learning about potential sources of grants, how to match a project to a specific call for proposal, and how write a compelling grant proposal become valuable skills for a teacher who wants to be an effective change agent.
- Fund-raising: There are also often donors in the community – both individuals and corporations – that may be willing to support instructional innovations (although it is often difficult for teachers to identify and connect with them on their own). Also, many of the innovations teachers may want to pursue in their classrooms are not very costly, and could be funded through simple fund-raising activities involving the students, their family and the community – as traditionally done for sports and field trips, for example.
- Using one's own resources: It is also clear that teachers like Gatto are never hesitant to do all that it takes to make an innovation successful – even if that means long work hours, week-ends, and sometimes even supplementing with one's own funds initiatives that could be otherwise be implemented!
- Securing a champion: For many of the initiatives a teacher may want to pursue, permission will need to be granted by higher authorities. Securing a "champion" in the administration that can help obtaining those permissions and overall support the innovation internally usually turn out to be very important.

**Figure 6. Illustration of selected strategies to "*Gather the necessary resources*"**

- *Using volunteers:* Gatto has often involved her students' parents and families whenever she needed helpers (as for example some parents participated in the Kentucky field trip as chaperones). She is not afraid to ask for help to her family and friends when needed. She also capitalizes on her student teachers to do activities that could not have been possible with just one teacher in the classroom.

- *Bootstrapping:* Gatto has become a master at bootstrapping, as she often has her class or other volunteer make what she cannot buy for an activity, she has used her extensive contacts to secure for free the help of experts or the access to equipment her school does not possess (as, for example, in the case of the video-conferencing facilities and machines to make the cookie cutters), she often has materials donated by local businesses, and she is not afraid to walk with her students whenever possible to avoid the cost of hiring a bus.
- *Capitalizing on social capital and networking:* Gatto asked all her friends and acquaintances to donate miles to support the Kentucky field trip; she did not hesitate contacting several high schools in her district until she located one that had the video-conferencing facilities she was looking for; when she got the idea for the Cookie Cutter project, she called a high school tech teacher she knew and proposed a partnership where his students would attend to the production side of the Cookie Cutters while hers would create the teacher guide. At the same time, the reason most people say "yes" to her requests is because she is very good at explaining what she wants to accomplish and why, and at making them want to be a part of an exciting initiative as a means to meet their civic responsibility.
- *Grants:* Gatto was able to secure more than $50,000 through grants throughout her teaching career. She also shared her strategy of writing down "grant ideas" in a folder and revisiting those notes whenever she hears of a new grant opportunity to see if there is a match.
- *Securing a champion:* Gatto's principals often played this role.

5. *Implementing and monitoring the initiative:* Once an initiative has been launched, a lot still needs to be done to ensure its success. The plan needs to be implemented, making modifications as needed; this implementation needs to be monitored and its outcomes evaluated – both to decide whether adjustments are needed in the original plan, and to decide whether it is worth continuing or not. Unlike most other entrepreneurs, teachers may be at an advantage here because, as mentioned earlier, most of the innovations they can engage in require that they are the main "implementer;" therefore, they can personally ensure that all the details are taken care of. Skills and practices that are especially important at this stage of the process include the following:
   - Paying careful attention to details: As in the case of planning, this is a skill that most successful teachers have developed at a high level, as it is also critical to the effective implementation of lessons and units.
   - Responding quickly to the need for changes in the plan: Even the best plans need continuous adjustments, based on how specific variables and possible options actually play out in practice, as well as the information acquired through monitoring. Furthermore, any of these adjustments will need to be made in a timely fashion, so as to

minimize the effect of potential problems. Once again, these are practices that mirror what teachers are asked to do in their classes everyday, as they continuously assess the effects of the implementation of their lessons and adapt their original plan accordingly.

- Reporting back to stakeholders and champions: Maintaining the support of one's champion and stakeholders requires that innovative teachers make an effort to regularly report on how the innovation is proceeding, to avoid surprises and potential withdrawal of support.

**Figure 7. Illustration of selected strategies to "*Make detailed plans*"**

- *Paying careful attention to details* – As she prepared her science curriculum materials for publication, Gatto often tried out specific lessons in her class, to make sure they really worked and that she was conveying all the details another teacher would need to know in order to repeat that lesson successfully.
- *Responding quickly to the need for changes in the plan* – Gatto had originally planned to simply produce and sell the cookie cutters**,** but after she was awarded the grant and read the regulations she discovered that she would not be able to use the grant funds to buy materials and then re-sell it. So, she called the program officer and asked her if she could instead produce and sell the teacher guides, and offer the cookie cutter for free when the guides were purchased, and she got permission to do so.

6. *Ensuring long-term sustainability/ growth:* For most entrepreneurs, an innovation is not truly successful unless it can be sustained over time. This, however, is only partially true in the case of teachers, as most of them start all over again every year with a new class of students – so, while they may repeat successful curriculum units or field-trips with another class, there is not the same sense of "sustainability" as in other enterprises (even within education). At the same time, we have witnessed ways in which entrepreneurial teachers can ensure that their innovative efforts "live on" beyond a specific class or even themselves as the teacher. For example:
   - Sharing their successful instructional innovations with other teachers who may want to repeat them: As mentioned earlier, this could occur through conference presentations, articles in journal, professional development workshops, or publishing curriculum materials. While doing so may greatly extend the impact and benefits of an innovative instructional activity or curriculum unit by having other groups of students experience it, teachers will have to balance these "benefits" with the additional time, effort, and sometimes also material resources, required to disseminate their innovations effectively.

- Taking an active role in preparing the next generation of teachers: An interesting way to ensure the dissemination and continuation not only of specific instructional units or learning activities, but also innovative approaches and practices more generally, is for teachers to participate in the training of new teachers – by taking student teachers regularly as interns in their classes, and/or by teaching courses or seminars in a teacher preparation programs.
- Creating "organizations" or infrastructures that will continue to carry out the innovation: This approach may be most appropriate for innovations that have to do with systemic changes occurring at the institutional, or community, level rather than within the classroom. For example, if a teacher has been successful in establishing peer support groups among her colleagues, it will be important to figure out ways that these groups can continue even if she moves to a different school or grade level.

**Figure 8. Illustration of selected strategies to "*Ensure sustainability*"**

- *Sharing successful instructional innovations with other teachers* – In addition to publishing the science curriculum materials, Gatto regularly presents at conferences and had also published a number of articles in professional journals.
- *Taking an active role in preparing the next generation of teachers:* Gatto proactively seeks having a student teacher assigned to her class each year, and has been regularly teaching methods courses in a teacher preparation program.

As shown by this analysis, there is indeed much more than one might have thought at first in effectively managing each of the key components of the process of initiating an innovation, and teachers – especially beginning teachers – should be supported in doing so.

***How could teachers best learn the entrepreneurial concepts and practices thus identified?***

While teachers could potentially learn about relevant entrepreneurial concepts through traditional means such as readings and/or lectures, this is not the case for the attitudes, skills and practices we have identified as effective to approach specific components of the entrepreneurial process of initiating an innovation. Rather, to teach these things effectively, we need to draw on what we know from research on the learning of complex skills and practices.

The work of Collins, Brown, and Newman (1989) and Lave and Wenger (1990) is especially relevant in this case. These authors suggest that individuals can benefit from first observing an expert engaged in the practice, possibly with the opportunity to ask questions about

what is taking place and why ("modeling"). The next step is then to participate in limited ways in the performance of the targeted practice in authentic contexts and under the guidance of an expert – what is often referred to as "legitimate peripheral participation" (Lave & Wenger, 1990). Finally, they can learn from engaging in the targeted practice independently, yet still benefit from some support and feedback ("independent practice").

While this sequence of experiences makes a lot of sense, the constraints of teacher preparation programs, university courses and in-service professional development may require some adjustments and adaptations in order to put these principles into practice.

First of all, it would be quite difficult to observe another entrepreneurial teacher or educator "in action" as part of a university course or even a long-term professional development program. Therefore, the "modeling" step will need to be achieved in a more indirect way. Based on the experience teaching the entrepreneurial courses mentioned earlier, the following experiences seem to be a valuable substitute:

- <u>Reading the case-study of successful innovative teachers:</u> Teachers can benefit from in-depth stories of other teachers engaging in innovations, both to develop images of what it means and what it takes to initiate innovations as a teacher, to be motivated to emulate the same behaviors, and to identify specific attitudes and practices worthwhile developing to achieve that goal. While there are few case-studies of <u>teachers</u> currently available**,** teachers can also benefit from reading case-studies of other social entrepreneurs and entrepreneurial educators. In either case, however, it is important that these narratives move beyond being an "inspirational story" to providing sufficient details to enable the reader to understand *how* an entrepreneurial educator goes about the process of implementing innovations.
- <u>Inviting innovative teachers as guest speakers</u>: Guest speakers can complement the reading of case-studies by providing valuable personal insights about the skills and practices they have found most useful at various stages of the process of initiating an innovation, as well as the personal and emotional aspects of being an agent of change. They also offer the great advantage that they can respond to questions from the audience! At the same time, these presentations may need to be carefully structured by a series of questions to avoid the risk that they turn into interesting but less valuable life stories, rather than provide insights on the <u>process</u> of initiating innovations.

- Having participants interview innovative teachers of their choice: This activity well complement the previous ones by allowing each participant to identify someone they know and would like to emulate, and thus is likely to be closer (and more relevant) to their own context and personal situation.

Similarly, scaffolded apprenticeship situations where groups of teachers participate together in the development of an innovation with the support, or under the guidance, of a mentor could be very effective, yet these situations would not be easy to orchestrate, especially within the constraints of a typical university course or summer institute. While it is unlikely that one could engage participants in a real-life process of initiating an innovation (whether through "legitimate peripheral participation" or "independent practice") in its entirety, it is both possible and valuable to do so at least with some of the initial stages of the process – for example, by generating ideas for possible innovations for the institution the participants are attending, and evaluating whether these ideas are truly opportunities worth following. It is also worthwhile to work with the participating teachers on developing specific skills that can be useful at various stages of the process – such as evaluating the costs of a specific project, identifying the risks involved in an innovation and figuring out ways to minimize or "manage" each of those risks, basic marketing principles and strategies, etc.

Another important element highlighted by scholars who have studied the development of professional identities (e.g., Gee, 2001) is the key role of reflection and making explicit connections between what learned and one's own practice. This, in turn, calls for assignments such as reflective journals (possibly shared with the entire class) or other written reflections that take place at critical points in the course. For example, the author has found it very effective to ask participants to reflect in writing on the implications of the entrepreneurial ideas learned in the course for one's own practice at the end of the course, as this activity served both as a culminating assessment and a way to help participants make personal sense of what they learned.

Finally, when considering options to include relevant entrepreneurial concepts and skills in the preparation of teachers, it is important to take into consideration the logistical constraints of most teacher preparation programs. Because of the many demands imposed by the state on teacher certification as well as by accrediting agencies, most teacher preparation programs – especially when offered at the graduate level – have little or no room for elective courses (such as a course on entrepreneurial skills for educators or funding strategies). In this case, it is more

realistic to think of developing an "entrepreneurship module" to be included in one of the required course that introduces just the basic ideas involved in the successful initiation of innovation so as to develop "awareness;" ideally, the concepts and practices introduced in this module could then be revisited in other courses as the pre-service teachers engage in experiences such as developing plans for innovative lessons or units.

## Conclusions

In this paper, I have capitalized on the field of entrepreneurship to contribute both new analytical lenses and practical ideas to strengthen the preparation of teachers, so as to develop more effective "agents of change." Building on the literature on entrepreneurship, the results of the case-study of an innovative teacher, and other case-studies of entrepreneurial educators, this paper identified a set of concrete practices that teachers interested in initiating innovations could use to increase their effectiveness at various stages of the process – i.e., when coming up with an idea for a worthwhile innovation, evaluating whether the idea is worth pursuing, making detailed plans, gathering the necessary resources to launch the innovation, implementing and monitoring the innovation, and securing its long term sustainability (if appropriate). The paper also suggests some concrete strategies and vehicles to help teachers appreciate the potential contributions of entrepreneurship and to learn more about specific practices they may be interested in employing.

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