A Model for Student Learning in Knowledge Translation and Transfer in Ontario

by

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Table of Contents

Abstract

The purpose of this study was to create a model for student learning in knowledge translation and transfer in Ontario. The study was informed by two focus groups, each associated with a student research communications skill development program at the University of Guelph, called Students Promoting Awareness of Research Knowledge (SPARK). One focus group *(n=9)* consisted of current and former SPARK participants. The second focus group *(n=10)* consisted of SPARK stakeholders who had variously supported SPARK through projects or benevolence, or had helped administer the program. Based on focus group feedback, a conceptual model was developed showing how SPARK participants translate knowledge from university researchers and transfer it to members of society, various communities (agriculture, health, environment, etc.) and stakeholders including the media, government and industry.

List of Tables

List of Figures

Chapter 1

Introduction

Background and settings

The need.   As the scope of agriculture changes, a golden age of agricultural communications is said to be unfolding around it (Doerfert, Evans, Cartmell & Irani, 2007). Agriculture is becoming increasingly relevant to more people, as a realization emerges that the sector encompasses the likes of natural resources, environmental and economic sustainability, nutrition and health, energy, and rural affairs. Agriculture is no longer simply food and fiber. And as it transforms, so does the media and communications that mirror it and put it in perspective for readers, listeners and viewers.

As the hunger to understand agriculture grows, science-based knowledge is becoming a cornerstone for major information sources such as governments. Science, rather than trust, is the touchstone for the 21st century (Wilson, 2008). Science helps explain phenomena, and in modern society, the media is often the public's primary source of science information. As such, the media can have a profound impact on how people view the risks and benefits of scientific advances (Caulfield, 2004).

The problem. Mainstream journalists convey science, including agricultural science, to the masses. But they may not be well versed in either science (Weigold, 2001), or in agriculture. Pellerin (2008) said this is a time of increased public interest in agriculture, and of widely reported media coverage of agriculture "splashed across the front pages of newspapers from coast to coast." Wingenbach, Rutherford, and Dunsford (2003) said all credible mass media science reporters strive for objectivity. But they do not frequently address agricultural topics, including those that involve controversial

science and technology applications such as biotechnology (Meyers & Irani, 2009).

Organizations are mobilizing to represent their industries to the media and others, such as

the National Institute for Animal Agriculture, tasked with developing and delivering fact-

and knowledge-based information that impacts public understanding on any issue of

importance (Speer, 2010). But through the lens of the agri-food sector, covering the

complexities of agriculture remains a problem for mainstream reporters and editors.

In fact, this situation has prompted global concerns about the quality of

agriculture reporting. Nudds (2010) said in Ontario, Canada, "yellow journalism (about

the agri-food sector) is being vomited on the pages of urban newspapers, blogs and radio

waves with increasing frequency…I think it is good that food production is gaining more

attention, but we need to make sure that consumers are getting the full story" (page 4).

Jefferson (2009) said in the United States, agriculture is taking a "public relations

beating" from incomplete, inaccurate or biased media reports, and warns that if the sector

is going to "replenish the reservoir of good will toward producers, quickly and

satisfactorily, it's time to pick a model and get to work" (page 9). Hurd (2010) said

media reports associated with the use of antibiotics in United States livestock production

with antibiotic resistance in humans are not based on science. Elsewhere, the minister of

agriculture for India appealed specifically to agricultural scientists there to double their

efforts against misunderstandings about genetically modified crops (Bhowmick, 2010).

Such crops are a trigger for anti-technology advocates, whose activities are likely to

escalate given farmers' belief that technology will be instrumental in addressing world

hunger, outpacing even education and training (Tasker, 2010).

Sensationalism and confusion created by news stories comes at an unfortunate time, when global agriculture faces challenges such as the need for increased crop production, a greater understanding of climate change and the tyranny of obesity. An increase in crop production of at least 50% is needed by 2050 (National Agricultural Biotechnology Council, 2009) to address hunger, while domestically, a decrease in the consumption of unhealthy food and diets is vital to stem the tide of obesity. In the United States, First Lady Michelle Obama is promoting a $400-million initiative to increase access to healthy, affordable food nationwide, to expand healthy food options to the country's "food deserts," underserved areas where consumers are forced to shop for food at gas stations and convenience stores (Travers, 2010). Food, and those who produce it, is on the public's radar screen like never before.

The increased profile of the agri-food sector is leading to an increased focus on efforts to develop agricultural communications and extension, to help articulate difficult concepts, challenges and opportunities (Agriculture and Agri-Food Canada, 2007a). The agriculture and food sector's connection to new knowledge is deeply rooted in what has traditionally been known as extension. Extension aims to bring about positive change on farms and in agriculture. This largely involves the use of processes to facilitate learning and change within the agricultural community. These processes, or extension methods, include groups, media, field days, education, advice, facilitation, lead farmers, focus farms, demonstrations, videos, publications and more. Extension also includes the process of planning research and extension, from understanding client needs, developing a plan, appointing staff and implementing and monitoring a program, through to evaluating impact (Fulton, Fulton, Tabart, Ball, Champion, Weatherley, & Heinjus,

2003).

Now, a discipline called knowledge translation and transfer (see Figure 1) is emerging. It is defined as the process of converting scientific and technological advances into marketable goods or services (Agri-Food Tech Transfer Network, 2010). Knowledge translation and transfer puts added emphasis on the early stages of research, with a goal of maximizing new knowledge's value through activities such as pre-dissemination interactions with potential stakeholders by knowledge translation and transfer specialists. Gordon (2008) distinguished between knowledge translation and knowledge transfer by explaining knowledge translation can encompass terms such as evidence-based decision making, research utilization, innovation diffusion, knowledge transfer, research dissemination, research implementation and research uptake. For its part, knowledge transfer consists of efforts to provide decision makers with the best available research findings to use in making policy and providing services. Its goal is to improve the quality of policy and practice outcomes (Gordon, 2008).
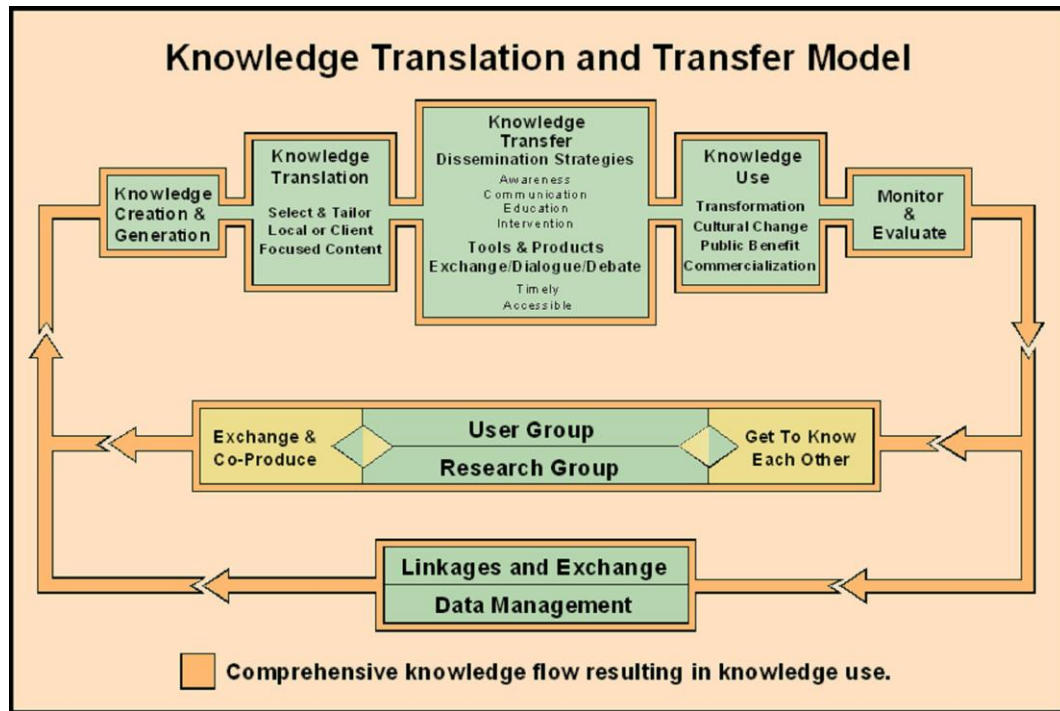
Figure 1. The knowledge translation and transfer model used to guide the research agreement between the University of Guelph and the Ontario Ministry of Agriculture, Food and Rural Affairs. SPARK participants contribute to the knowledge translation and transfer process by creating focused content (knowledge translation) and through dissemination strategies such as awareness, communication and education (knowledge transfer). Ontario Ministry of Agriculture, Food and Rural Affairs, 2009.

The emergence of the importance of knowledge dissemination bodes well for the field of agricultural communications, which helps develop speaking and writing skills in individuals involved in research dissemination (R.M. Moccia, personal communication, February 1, 2010). The impact of knowledge translation and transfer is particularly pertinent in countries where agriculture and food are major economic drivers, such as Canada. The agri-food sector is the second largest industry in the country, accounting for approximately 8% of the total Canadian gross domestic product and employing 13% of

the workforce (Agriculture and Agri-Food Canada, 2007b). Of Canada's ten provinces and three territories (see Figure 2), the Province of Ontario has the largest agri-food sector in Canada, owing to the diversity of basic production and processing. Ontario's 57,000 farms, 5.3-million hectares of farmland (Government of Ontario, 2009), and 3,000 food processing companies contribute more than $33-billion annually to the province's economy (Alliance of Ontario Food Processors, 2010).

Agri-food is a knowledge-driven sector that feeds a country's economic engine. Finnerty (2010) said that with the United States encountering economic turmoil and unemployment hovering around 10%, agriculture has helped fortify the economy when it needed it most. Other sectors such as U.S. automobile manufacturing, real estate and construction have contracted and shed workers. In Ontario, the situation is similar. Ontario is Canada's leading manufacturing province, accounting for about half of the total national manufacturing shipments (reference.com, 2008). Like the US, a downturn in automotive manufacturing and other sectors has cost the province almost 300,000 jobs (Toronto Star, 2009).

Figure 2. Map of Canada. Ontario, the focus of this study, appears in yellow in the centre of the map, just above the Great Lakes (canadamaps.info, 2010).

Agriculture in Ontario is increasing its dependence on knowledge translation and transfer. Stoneman and Pilley (2001) said an agricultural revolution has begun, with farmers being bombarded by new technologies to produce better, cheaper and safer foods, as well as foods with special traits for niche markets and genetically altered crops for areas once thought unsuitable. New technology will let farmers make the best of poor weather, help them apply crop protection products in the most timely manner, and help them make management decisions that were incomprehensible in the past.

Farmers believe research is a priority. They are concerned about the consequences of insufficient research funding. Such concerns have prompted the formation of a lobby

group of 100,000 Canadian grain farmers called Farmers for Investment in Agriculture, which has targeted the federal government to increase its commitment to agronomic research by 40% (Grain Farmers of Ontario, 2010).

Canada's federal government already dedicates 19 research stations, 600 scientists and 2,300 employees to agricultural research (Agriculture and Agri-Food Canada, 2009). But it but does not support university-government extension relationships such as those that exist in the United States, through the Justin Morrill Land Grant Act of 1862. That legislation provided federal land support to states or territories which agreed to implement a public institution for teaching mechanical arts and agriculture, and to promote liberal and practical education. The act's intention was to promote economic stability, development and prosperity, through agricultural production (National Academies Press, 2009).

The closest facsimile in Canada to U.S.-style university-government extension is the contract for research and services between the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), and the University of Guelph, Canada's largest agricultural university. For the past eight years, Guelph has also been Canada's top comprehensive research institution. Universities are ranked based on sponsored research income from both government and non-government sources, and Guelph is consistently the top institution among comprehensive universities (those without a medical school).

The contract is supported through an annual allocation from the Ontario government that began well before the university's inception in 1964, with support for research mainly at two of the university's founding colleges, the Ontario Agricultural College and the Ontario Veterinary College. OMAFRA and the University of Guelph

have a long history of working with farmers and agri-food sector representatives (e.g., animal nutrition companies, crop protection companies, etc.) to ensure ministry-funded research is meeting current needs, and that the results of research are quickly and effectively transferred to those who can utilize them. Ministry staff and university researchers have close working relationships and regularly engage in activities that support knowledge translation and transfer (Ontario Ministry of Agriculture, Food and Rural Affairs, 2010).

In 2008-2009, the allocation from the province for the agreement was $59 million. The agreement has been credited with having garnered significant social, economic, environmental and health benefits for the industry and province, returning more than $1.15 billion to the Ontario economy annually (University of Guelph, 2009a). Innovations produced through the agreement include eggs with omega-3 fatty acids, milk with docosahexaenoic acid, and *Enviropigs*, genetically engineered hogs that efficiently digest plant phosphorus (University of Guelph, 2010a). The agreement is highly valued by the ministry and the University of Guelph for helping maintain personnel to conduct long-term research programs such as plant and animal breeding (Hunt, 2008).

But despite the sector's contributions to society and its significance to the economy, it has been stymied by barriers such as poor access to innovation-development capital. Lynch (2010) said that Canada's public research capacity has improved greatly over the years, but it needs to focus on building global centers of research excellence, better commercialization of research efforts to create jobs and wealth and better models of business-university partnerships and better market-based means of financing the application of innovation. Canada rates poorly in productivity, having fallen to just 75%

of the productivity level of the United States. The Conference Board of Canada (2010) said Canada continues to be what it called a "D" performer on innovation, ranking 14th place among 17 peer countries. It ranked second-last on the number of international trademarks. The board said Canada is well-supplied with educational institutions and carries out scientific research that is well-respected around the world. But with only a few exceptions, the country does not successfully commercialize its scientific and technological discoveries into world-leading products and services.

Another barrier to agriculture involves communications and inaccessibility to information, as a result of cutbacks to extension throughout Canada in the 1990s. MacArthur (2008) says Alberta, Canada's main beef-producing province, was once the envy of prairie farmers, with district agriculturalists and home economists scattered across the province, dispensing advice. But over the past 15 years the rural staff was dismissed, offices were closed and a centralized help centre was started instead. In Ontario, in December 1999 OMAFRA reduced its advisory and technology transfer services as a result of budgetary constraints (Frakes, 2000). Changes included the loss of about 40 staff and the closure of 32 field offices, which housed extension agents and were often meeting locales for area agricultural and rural groups.

These closures were considered a blow to rural Ontario (Stoneman & Pilley, 2001). The offices were replaced with seven rural business enterprise centers and 13 agricultural technology resource centers, the latter of which were focused on providing support to staff specialists rather than walk-in services to clients. According to Brain, Mahone, and Filson (2006), "extension officers…disappeared as a result" of the cutbacks (p. 717). The researchers said compared to the US with its land grant universities,

government-funded extension officers and agricultural extension, education,

communication, and education at graduate levels, Canada faces a much larger challenge

in increasing agricultural awareness and communication.

Nonetheless, despite the cutbacks, a significant extension/knowledge translation

and transfer core have flourished. Gwyn (2010) says scores of OMAFRA employees are

dedicated to some aspect of extension. Their expertise includes agroforestry, alternative

livestock, aquaculture, beef, canola, cereals, corn, dairy, emerging crops, entomology,

forages, goats, integrated pest management, nutrient management, poultry, sheep, soil

fertility, soybeans, water engineering, and weed management (Ontario Ministry of

Agriculture, Food and Rural Affairs, 2009a). These specialists are highly respected as

experts in their field (Roberts, 2009), engaged in provincial, national and international

research endeavours, and credited with making significant contributions to knowledge

translation and transfer. They orchestrate numerous forms of outreach, including

speaking at grower meetings, hosting field days at research plots, teaching short courses,

generating specialty newsletters, responding to media queries, and maintaining blogs,

such as the Baute Bug Blog (Dallimore, 2009). Their expertise, along with that of

researchers at the University of Guelph, represents significant intellectual capital in agri-

food knowledge.

To increase communication and uptake related to that intellectual capital, a new

initiative was unveiled when the OMAFRA – University of Guelph agreement was

reviewed and renewed in 2008. As part of the agreement, $1 million a year for the next

five years was dedicated to knowledge translation and transfer. This marked the first

time Ontario resources had been dedicated to the emerging field of agricultural

knowledge translation and transfer, with a vision towards increasing knowledge delivery to stakeholders. The University of Guelph's business development office was tasked with taking a leadership role in identifying and transforming research findings and trends into successful commercialization initiatives. Office personnel were urged to use superior communication skills to leverage established networks and make contacts (Cundari, 2010). Moccia (University of Guelph, 2009a) said working with the private sector and getting technology more rapidly moving from the laboratory to the end user requires specific education and communication skills. He said during negotiations required for the contract renewal, government and industry stakeholders said the contract administrators "need to be able to enhance [skills] and take [communication] to the next level. That reinforced to me the need to involve communication outreach in the next partnership."

A possible solution to the problem. At Guelph, students have been engaged in technology translation and transfer for 20 years (although their engagement was called communications, rather than extension or technology translation and transfer), through a student research-writing, experiential-learning program called Students Promoting Awareness of Research Knowledge. SPARK aims to give students greater employability potential, by equipping them with superior skills in journalistic writing, editing, photography, social communications, and videography (University of Guelph, 2010b).

The program was launched by the researcher in 1989, two years after securing a job as research editor in a one-person research communications unit in the university's Office of Research. The researcher's duty was to write journalistic stories about University of Guelph research and place the stories in the media. The university had

made a decision to bring a journalist on staff specifically to communicate about agri-food

research mainly connected to the contract with OMAFRA. The university recognized the

potential benefits of media exposure and working with journalists. Waddell, Lomas,

Lavis, Abelson, Shepherd, and Bird-Grayson (2005) said for researchers who seek more

research use in policy making to improve health and healthcare, "working with the news

media may represent an opportunity, given the media's pivotal role in public policy

agenda-setting…there are opportunities for policy-oriented health researchers to work

constructively with newspaper journalists" (pp. 125-126). The same goes for agriculture,

as news consumers' preferences continue trending towards customized news selection

and health-related news, much of which has its basis in food (nutrition, obesity, etc.) and

agriculture (biotechnology, pesticides, hormones, etc.).

In 1988, the researcher became acquainted with student journalists Gregory Smith

and Andrew Wagner Chazalon from the University of Guelph student newspaper, The

Ontarion. The student journalists proposed that they too write research stories, under the

researcher's purview. The researcher proposed this concept to Office of Research

administrators and received approval to start a student research-writing initiative in 1989.

At SPARK, students work out of a 600-square-foot newsroom-like setting (see

Appendix G) in the Office of Research on the fourth floor of the five-floor University

Center. The newsroom is set up in rim-like fashion, with the SPARK coordinator serving

as editor at the center of the rim surrounded by nine reporting stations, three equipped

with telephones that are shared among the participants. The coordinator is part of the

university's three-person research communications unit with also includes a director (the

researcher) and a manager of communications and marketing who is responsible for

SPARK human resources (staffing, accounting and fiscal matters) as well as selling

advertising for the thrice-yearly *Research* magazine, and for generating and

administering agreements between stakeholders and SPARK. Work for service is the

main way students are paid, through activities such as writing research stories for

commodity publications, shooting research videos, and recording radio spots for

commercial and non-profit websites, television programs and radio stations, and

producing externally oriented publications for various departments. SPARK participants

have generated significant print news stories and audio and video news stories, while

being trained in science journalism and developing valuable communications portfolios

for themselves (see Appendix A).

Students from all disciplines with an interest in communications are invited to

participate in SPARK. Recruitment takes place through word of mouth from current and

former SPARK participants, referrals from staff, students and faculty, and by invitation

from the researcher to students he teaches in two undergraduate agricultural

communications classes. No paid solicitation for participants is conducted. Prospective

participants are required to take an aptitude test, which consists of rewriting a poorly

written news release from an external source. Successful applicants receive a contract for

an agreed upon number of hours per week, ranging from five- to 20 hours, depending on

their availability and SPARK's workload. One co-op student works 35 hours a week.

Participants receive a 10-page SPARK writer handbook (see Appendix B) with advice on

matters such as researching a story, interviewing, organizing a story, writing an

introduction, style, and editing.

Participants also have continuous accessibility to the SPARK coordinator and to the director. The coordinator and the director (and other specialists where needed, such as video professionals) offer an average of four one-hour workshops per semester on writing and journalistic skills, such as choosing an angle, writing objectively, transition, interviewing techniques, and video editing. SPARK participants are invited to attend professional development activities and networking opportunities through seminars and meetings offered through professional associations such as the Eastern Canada Farm Writers Association, the International Federation of Agricultural Journalists, the Canadian Science Writers Association, the Association for Communication Excellence, the American Agricultural Editors' Association, and the Society for Technical Communications.

Once participants become acquainted with the writing process (after three- to five stories), they are expected to complete one 500-word story in approximately 10 hours, from the time it is assigned to the time they receive approval for the final draft from the researcher. Typically, each story goes through two drafts. In 2009, SPARK writers wrote 97 stories and produced 24 videos. SPARK story ideas are generated by the researcher (as director of research communications) through such avenues as suggestions from superiors, discussions with colleagues, tips from researchers, trust fund notifications (see Appendix E), and strategic partnerships with external organizations such as the Dairy Farmers of Ontario, the Grain Farmers of Ontario, and the Canadian Farm Business Management Council. The researcher is also cross-appointed to the administrative unit that oversees the OMAFRA agreement, which funds approximately 150 research projects annually. In that capacity, the director has access to personnel who manage the

agreement, including a communications specialist who provides story ideas.

The researcher liaises with the SPARK coordinator, who assigns the stories to the SPARK participants. This process involves presenting each SPARK writer with a story summary and contacts. Stories and videos written and produced by SPARK writers are published widely (see Appendix J), particularly off campus, in trade publications, newspapers, magazines, and electronic communication portals. They also appear in university publications with an external focus, particularly the University of Guelph *Research* magazine (see Appendix K). SPARK participants cover all research on campus, but because more than half of the research at the University of Guelph is agricultural in the broad sense (which can mean production agriculture, food and nutrition, environmental matter such as soil and water health, and sustainable rural communities), the majority of their communications is about agriculture. Researchers are given final approval on all story drafts to ensure scientific accuracy (Hruska, 2008).

In 1999, the Natural Sciences and Engineering Research Council, Canada's biggest scientific granting council, launched a program to introduce SPARK programs at other Canadian universities. The council committed $7,000 over three years to ten institutions each, and offered the guidance of the researcher, who served on the council's communications committee. A few years later, the number of participating universities climbed to 20. However, when the council's funding for the program ceased, SPARK activities finished at most universities. Administrators were unable or unwilling to raise the funds to keep them going, and for most it was an additional responsibility in their already busy portfolio (J. French, personal communication, May, 2006).

Objectives, research questions, hypothesis

The objective of this study was to determine students' potential role in an agricultural knowledge translation and transfer system in Ontario, and ultimately develop a model describing that role. The hypothesis was that student learning can be an intrinsic part of translating and transferring information, based on students' proximity to researchers at the University of Guelph, their participation in SPARK and the uptake of SPARK products.

Research questions

The study was guided by four research questions:

1. How does the SPARK program affect participants' career decisions and employers' hiring decisions?

2. What are the successes and limitations of SPARK, and its potential for replication elsewhere?

3. What is SPARK's current and potential role in knowledge translation and transfer?

4. Is SPARK part of a new social movement of science-literate members of society?

Definition of terms

Agricultural communications - The use of different channels of communication to exchange information about the agricultural and environmental sectors (Agriculture and Agri-Food Canada, 2007b).

Associate vice-president (agri-food programs) – The University of Guelph senior administrator responsible for knowledge translation and transfer program implementation, identified by name in this study as *R.M. Moccia*.

Extension - The passing of knowledge from educational institutions to information users (Anderson & Feder, 2004).

Globe and Mail – A major daily, national newspaper in Canada.

Knowledge translation and transfer (KTT) – A discipline emphasizing the synthesis, exchange and application of knowledge, with the dissemination of research results as the final activity (Ontario Ministry of Agriculture, Food and Rural Affairs, 2009b). Knowledge translation and transfer activities take various forms, including presentations, publications, websites, seminars, workshops, symposia, networks and exhibits. Researchers not only serve in traditional ways to extend information (scientific committees, producer group meetings etc.); through knowledge translation and transfer, they also participate in media interviews to disseminate research knowledge to a broad public audience (University of Guelph, 2009b).

New social movement - An important learning site capable of generating new knowledge and action, which could result in significant social change (Welton, 1993).

Qualitative research – The studied use and collection of a variety of empirical materials that describe routine and problematic moments and meaning in individuals' lives (Denzin & Lincoln, 1994). It is distinguished by an interpretive, naturalistic approach to its subject matter.

Technology transfer - The process of converting scientific and technological advances into marketable goods or services (Agri-Food Tech Transfer eNetwork, 2010).

Trust fund notification – Notification given in written form when a new research grant is awarded and a trust fund is started.

University of Guelph - One of seven Ontario universities to attract more than $100 million or more annually in sponsored research income (University of Guelph, 2009d). Through a contract (popularly called an agreement) with the Ontario Ministry of Agriculture, Food and Rural Affairs, the university manages research and education programs and related facilities, including three regional campuses and 13 off-campus research facilities. The agreement has seven key research components: environmental stability, food for health, agricultural production systems, industrial uses for the bioeconomy, agricultural and rural policy, emergency preparedness, and product development and enhancement.

Limitations of the study

For this study, subjects were solicited to participate in qualitative focus group studies. The study facilitators were limited by the number of participants and stakeholders that could be accommodated in a focus group. For the most part, the subjects were located no more than a two-hour drive from Guelph, limiting the geographic representation of opinion that could contribute to the body of knowledge. Although the researcher's judgment and experience was used in a deliberate effort to obtain representative samples, research subjects were from a homogenous area.

Other limitations include the fact that the study does not deal with decision makers in disciplines outside of agriculture, even though approximately 25% of SPARK's output is related to research outside of agriculture. As well, this study did not include University of Guelph faculty members among stakeholders. Faculty members

who had agreed to take part in the focus groups were unable to do so when the focus group took place.

The drive to encapsulate SPARK into a model may itself be a limitation on this study. Chapanis (1961) said a model "can tolerate a considerable amount of slop" (p. 118), suggesting modeling may glamorize the initiative being modeled, or not accurately represent it.

Basic assumptions

It was assumed the nine SPARK participants were representative of the approximately 200 participants who have taken part in the program, and that their purposive selection, determined mainly by proximity, availability and occupation, represented the opinions of past participants who were not included in the sample. It was assumed the study participants chose to get involved in the study because they wanted to contribute to the advancement of the program. A similar assumption was made about the stakeholder participants, who were assumed to be representative of approximately 100 stakeholders who have been involved with the SPARK program since its inception.

Significance of the problem

Ineffective mass communications and other mediated coverage of agricultural issues is a dilemma for the farm sector. The National Research Agenda - Agricultural Education and Communication 2007-2010 (Osborne, 2007), which was designed to establish research priorities for the discipline, likewise cited this as a key problem. Building competitive societal knowledge and intellectual capabilities is the most frequently researched research priority of the agenda to appear in the *Journal of Applied Communications*, a primary outlet of agricultural communications research dissemination

(Edgar & Rutherford, 2009). Doerfert and Miller (2006) said agriculture is transforming itself in this information age. To that end, a research study that ultimately offered a template for students' participation in a new vision for agri-food knowledge translation and transfer can enhance information dissemination to farmers and other agri-food industry stakeholders, and improve knowledge uptake. The value of experiential learning in agricultural education has long been recognized as an important part of the educational process; in this case, it can give students new learning opportunities and enhance their employment potential. Finally, such a study can help consumers better understand agri-food processes and research and contribute to building competitive societal knowledge.

Summary

Knowledge translation and transfer is a vital aspect of research, one of the Ontario agri-food sector's highest priorities. SPARK responds to this need. The program has never before been constructed as a potential model for describing and formalizing students' involvement in knowledge translation and transfer. Agricultural communications is a growth area in the broad profession of agriculture, for connecting with producers as well as meeting consumers' escalating interest in food, health, the environment and rural communities. Individuals such as graduates skilled in communicating about agriculture make competent employees who tend to be highly innovative in their thinking (Bisdorf-Rhoades, Ricketts, Irani, Lundy, & Telg, 2005), at a time when such skills, along with the ability to adapt to new challenges, are essential. Evans (J. Evans, personal communication, January 24, 2010) said agricultural communications and journalism is at the heart of the agri-food sector, and that any part of

the value chain can grind to a halt without a successful communications effort. It is the

lifeblood of the industry.

Chapter II

Review of the literature

Purpose of the study

The purpose of this study was to determine students' potential role in a knowledge translation and transfer system in Ontario, and ultimately to develop a model describing that role. The hypothesis was that students can be an intrinsic part of translating and transferring information, based on factors such as their proximity to researchers, their participation in the program Students Promoting Awareness of Research Knowledge (SPARK) and the training they receive, the significant uptake of knowledge translated and transferred through SPARK, and the connections they make with the media, industry and government.

Research questions

The study was guided by four research questions:

1. How does the SPARK program affect participants' career decisions and employers' hiring decisions?

2. What are the successes and limitations of SPARK, and its potential for replication elsewhere?

3. What is SPARK's current and potential role in knowledge translation and transfer?

4. Is SPARK part of a new social movement of science-literate members of society?

Research knowledge bases and theoretical frameworks for experiential learning, experiential education, knowledge translation and transfer and focus group studies inform

this literature review. Pertinent communication models that guide and inform the SPARK experience and process are included as a foundation for the development of a model for student learning in technology translation and transfer in Ontario.

Theoretical framework

Grand level theory

A fundamental grand concept theory guiding this ethnographic research is pragmatism and the philosophy of experience, as developed by Dewey (1938), as well as experiential learning, described by Kolb and Fry (1975). Some basic elements of pragmatism, such as practicality and applicability, are aligned with agricultural extension's goal of significantly improving the life situation of its clientele (Nagel, 1997). Because knowledge translation and transfer is an outgrowth of extension -- a sort of *nouveau* extension -- it is reasonable to suggest a goal of knowledge translation and transfer is also to improve the life of those who use it or receive it.

The tenets of experiential learning – that is, making meaning from direct experience (Kolb & Fry, 1975) – parallel a foundational *raison d'être* of SPARK. Students make meaning of research by directly experiencing it, digesting or translating it, and then retelling it or transferring it to users. Like SPARK, participatory extension is distinguished by learning in the field, rather than in the classroom, and by people learning from each other through a dialogue. In this way, a communication loop may develop which may be aided with electronic communication and social communication. With it, the loop is almost immediate, and populated with people social technographers called creators (Li & Bernhoff, 2008), who are committed to near perpetual communications through social communication tools such as web pages, blogs and video uploads. SPARK participants are what Prensky (2001) called digital natives, having grown up

with digital technology such as computers, Internet, cell phones and other mobile

devices. Their abilities and comfortableness with modern communications technology is

significant.

Mid-level theory

Pragmatism lends itself well to problem-based learning. The Learning Theories

Knowledgebase (2007) described problem-based learning as a pedagogical approach and

curriculum design methodology often used in both higher education and K-12 settings,

defined and driven in part by challenging, open-ended problems with no one right

answer. By definition, such a learning style covers pedagogy, and by virtue of being

adaptable to higher education, also covers andragogy (or "andragogy-age" learners),

thereby meeting the needs of a diverse stakeholder group. Problems should promote

dynamic idea exchange among stakeholders, who for the purposes of this study are

farmers, consumers and government officials.

Given the conventional and pragmatic target group or user group of SPARK-

generated information (e.g., farmers, consumers, bureaucrats), theory based on life

experience is crucial to a knowledge translation and transfer model involving students.

OMAFRA is primarily interested in supporting extension as a knowledge diffusion

vehicle, to help farmers compete and be profitable. If knowledge is paramount in the

new extension scenario, successful participants will need to use a common language

developed through life experience and some formal education. This approach can offer

numerous opportunities for lifelong learning. In a time-tested statement on education,

Dewey (1938) said a sound educational principle is that students should be introduced to

scientific subject matter through acquaintance with everyday social applications. But in a

new model, both andragogical and pedagogical approaches will be required to successfully introduce technology translation and transfer, if indeed a goal is to create a sector-wide extension-friendly culture and environment.

Knowles, Holton and Swanson (1998) said adult learners seek relevance and that they are motivated to learn new material if it is applicable to their real-life situations. So then, if Tyler's (1949) advocacy of objective-based curriculum is correct, we might extrapolate that relevance is also true in the realm of pedagogy. Tyler reminds us educators recognize the value of beginning an education program with present student interests as a starting point, if such interests are deemed desirable. And certainly, students would see their own interests as relevant.

This approach also touches on the minmax principle put forward by utilitarianism philosopher John Stuart Mill. In their interpretation, Thibaut and Kelley (1994) said according to minmax, people seek to maximize their benefits and minimize their costs. So, the higher the number in an outcome matrix, the more attractive the behavior that might make it happen. Applying this principle to knowledge translation and transfer (and considering "costs" equate to resources, which include time), a scenario is envisioned where new levels of participation are indeed possible. However, they will only be realized if stakeholders perceive benefits from their input.

Substantive level theories

Like extension, knowledge translation and transfer must focus on stakeholders' needs. In identifying those needs, Nagel (1997) encouraged modern extension directors (and thus, knowledge translation and transfer officers) to consider three main issues or concerns. First, they should concentrate their work on those activities where there is a

comparative advantage. Second, they need to improve management procedures within

their organizations (including decentralizing management decisions to improve the

efficiency and effectiveness of extension operations). And finally, escalating pressures

for increased accountability are being fueled by a growing frustration with top-down,

bureaucratic behavior that has made extension appear unresponsive to the needs of its

clientele. Nagel said that means leaders, technical specialists, and the field staff must

increase farmers' participation in assessing needs, setting priorities, and implementing

programs. Through social communication in particular, farmers – and indeed all

stakeholders – have new opportunities for feedback.

Experiential education and experiential learning

SPARK involves experiential education for the coordinator and the director, and

experiential learning for the participants. It is not unusual for SPARK participants to join

the program with no background whatsoever in journalistic writing, necessitating a

pronounced teaching and mentoring role for the coordinator and director. At the same

time, the participants learn on the job, through training to some extent, but through

experience to a much greater degree.

In an applied field such as agricultural communications, distinguished by skill

development, understanding a learners' realm of experience is vital for advancing the

skill (e.g., writing, broadcasting, etc.) to be learned and developed. In addition, that

experience can be used to help learners understand the application of new skills; for

example, how such skills can help them succeed in definable and identifiable areas in

which they once failed (e.g., inability to clearly write, or speak). It is an exciting,

practical approach to a dynamic and useful discipline.

SPARK also has a role for experiential learning. Intellectual thought related to experiential learning is often said to date back to Confucius (450 BC), who in Lowy and Hood (2004) is credited with having uttered "Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand." This is clearly an example of experiential learning. In more modern times, in his seminal dissertation on the philosophy of experience, John Dewey (1938) contended that the learners' level of experience must be considered when constructing educational programs. Dewey believed instruction should start with the experience learners already have, and that this experience and the capacities that have been developed during its course, provide the starting point for all other learning. According to Dewey's reasoning, it is vital to know the students' status quo, and if and why they are of a certain mindset, in order to assess their starting point and ultimately measure their progress. Yet despite his zeal for experience, Dewey acknowledged that some experiences may actually be mis-educative. Not all experiences lead to enlightenment, and that being the case, experience and education cannot be directly equated to each other.

More recently, experiential education has evolved into two camps that, as Confucius urged, involve the learner. The first (Brookfield, 1983) is distinguished by learning undertaken by students who are given a chance to acquire and apply knowledge, skills and feelings in an immediate and relevant setting. The second type of experiential learning is education that occurs as a direct participation in the events of life (Houle, 1980). Here, learning is not carried out through a formal educational institution, but rather, by people themselves. It is learning that is achieved through reflection upon everyday experience and, according to Houle, is the way that most of us learn.

This variation in experiential learning develops further with Weil and McGill (1989), who categorized it into what they call villages. Each village is concerned with a different aspect: assessing and accrediting learning from life and work experience, bringing change in the structures of post-school education, group consciousness raising, and personal growth and self-awareness. The village theory followed an earlier popular attempt (Kolb & Fry, 1975) to understand and explain experiential learning through a four-part cycle, based on concrete experience, observation and reflection, the formation of abstract concepts and testing in new situations. In this approach, the learning cycle can begin at any one of the four points. However, Kolb and Fry suggest that the learning process often begins with a person carrying out a particular action, and then seeing the effect of the action. This is followed by understanding the effects, so that if the same action was taken in the same circumstances, it would be possible to anticipate what would follow from the action. Finally comes understanding the general principle under which the particular instance falls.

Ultimately, the distinguishing feature of experiential learning is that the experience of the learner occupies a central place in all considerations of teaching and learning (Andresen, Boud, & Cohen, 1995). Learners analyze their experience by reflecting, evaluating and reconstructing it, to draw meaning from it, in light of prior experience. It may or may not lead to further action. Through practice and experience, SPARK students apply what they have learned in real situations, making learning material understandable and usable. In the process of gaining experience, new situations arise causing learners to seek additional information and new ways of applying what they have learned (Cheek, Arrington, Carter, & Randell, 1994).

Focus groups

Morgan (1997) said focus groups are a research technique for collecting data through group interaction on a topic determined by the researcher. The researcher's interest provides the focus; the data themselves comes from the group interaction. The main advantage of a focus group is that it gives the researcher the opportunity to observe a large amount of interaction on a topic in a limited period of time. Focus groups can provide preliminary research on specific issues in a larger project.

According to Krueger and Casey (2008), focus group interviews typically feature people who possess certain characteristics and provide qualitative data in a focused discussion to help understand the topic of interest. Focus groups are typically composed of five to ten people, and must be small enough for everyone to have opportunity to share insights, yet large enough to provide diversity of perceptions. The questions in a focus group are carefully predetermined and sequenced so they are local to the participant. Focus groups work particularly well to determine perceptions, feelings and thinking about issues, products, services or opportunities. They have been found to be useful prior to, during and after programs, events or experiences, but especially at three identifiable points in the life of a program (Krueger & Casey, 2008). First, focus groups are used to gain understanding, to see the matter through the eyes and hearts of the target audience. The second is to pilot test the prototypes created by design experts based on information from the first focus groups. The third point is after a program is up and running, as is the case with this study.

Morgan (1997) said focus groups can be used to develop the content of applied programs. The plan for a focus group includes the purpose, background information,

types of information needed, types of participants to be invited, number of groups to be

conducted, plan of action, products or deliverables, timeline, and budget. Basch (1987)

said subject recruitment should be tailored to the research aims.

Communication models

Mortensen (1972) said a model is a systematic representation of an object or event

in idealized and abstract form. He described models as being arbitrary by their nature,

and said the key to their usefulness is the degree to which they conform to the underlying

determinants of communicative behavior, or the manner in which something functions or

operates.

Some popular communication models help inform this study and its purpose, such

as the linear Shannon-Weaver model (see Figure 3). In this model, information is

transmitted through an identifiable channel, from a source to a receiver. The transmitter

encodes it with a certain language or code, and the receiver decodes it. SPARK

participants influence the input by interpreting the research from the information source

(i.e. the researcher). In a corporate sense, the university is the sender or the transmitter

(in all cases other than social communication). But by virtue of being the author and

employed by the university, SPARK participants have a significant stake in the sending

process. The channel chosen depends on the SPARK participants' output (print, audio,

video or new media, such as a blog). Receivers, also known as message decoders, are

targeted by SPARK participants even before their stories are assigned (e.g., general

audience, agricultural audience, consumers, etc.). The code between the sender (the

university and the SPARK participant) and the receiver is science and research.
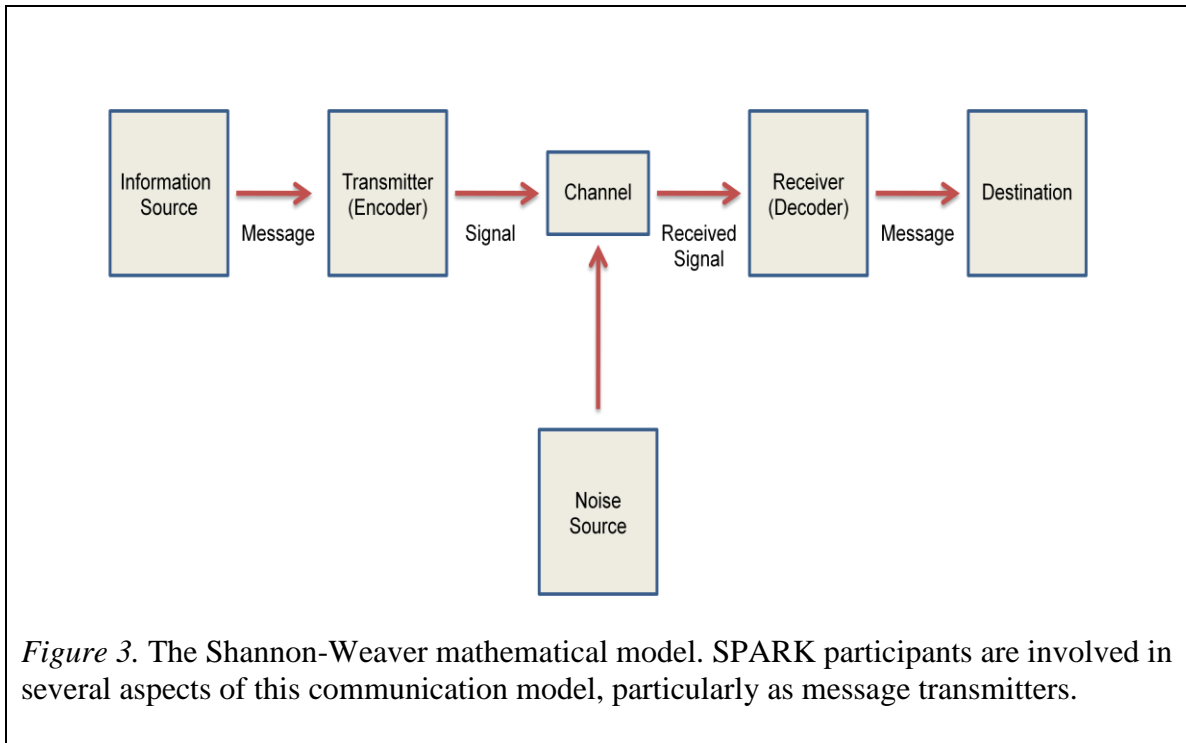
Figure 3. The Shannon-Weaver mathematical model. SPARK participants are involved in several aspects of this communication model, particularly as message transmitters.

The two-step flow theory has application to SPARK, as well. Lazarsfeld and Katz (1955) said the first step in the information flow process involves a channel from mass media to opinion leaders, who interpret it and then, as a second step, transfer it to the public. In other words, information channeled to mass media is sent to readers, listeners and viewers through opinion leaders with access to media. These opinion leaders are said to have a more literate understanding of media content, and can explain and diffuse the content to others.

Through SPARK, however, the opinion leader may be passed by, replaced instead by direct contact with the public. SPARK communications do not go through an opinion-leader filter, opening up the potential for direct contact with farmers. Campbell (A. Campbell, personal communication, March 8, 2010) estimates more than 80% of Canadian farmers have access to some type of Internet, based on polling research in

December, 2008 that showed 75 per cent were online.

New social movements

On some level, the community of learners created through the SPARK program may be seen as part of a new social movement (NSM) of knowledge-literate youth who are comfortable with modern technology and assimilated in the ever-increasing but perhaps invisible influence of science. They may be branded Generation X, or Generation Y, but more likely they are actually a subset.

An NSM is an important learning site capable of generating new knowledge and action, which could result in significant social change (Welton, 1993). Laraña, Johnston, and Gusfield (1994) noted numerous characteristics of NSMs that have some element of SPARK also exhibit a pluralism of ideas and values. They tend to have pragmatic orientations that enlarge the systems of members' participation in decision making. NSMs often involve the emergence of new or formerly weak dimensions of identity – those formerly known as or dismissed as nerds or geeks perhaps, who have a greater appreciation for and ability to cope with an accelerated science-based world. In an NSM, the relationship between the individual and the collective is blurred; many contemporary movements materialize in individual actions, rather than through or among mobilized groups. NSMs often involve personal and intimate aspects of human life, which might include the pursuit of science as leisure. NSMs employ mobilization patterns characterized by non-violence and civil disobedience, or perhaps heightened civil awareness. And there is no centralized or mass party; instead, NSMs tend towards "considerable autonomy of local sections" (page 9). Klapp (1969) called NSMs identity seeking movements, fuelled by people trying to reclaim something they consider to be

robbed.   At the micro level, individuals join NSMs because of their embeddedness in social networks that render them "structurally available" (page 36).

In Canada, NSMs have traditionally been associated with adult education and labour movements. However, as a more knowledge-based society develops and emerges, NSMs may be identified as groups who come together as learners in an experiential education initiative or identifiable learning site such as SPARK, with a goal of influencing policy, or at least shaping public opinion, that affects society. Selman and Dampier (1991) said a popular-education movement is emerging in Canada, with the labour movement, women's and environmental movements, co-operatives and church-related groups. These groups involve themselves in decisions about how knowledge will be used, in much the same way SPARK translates, mobilizes and transfers knowledge among stakeholders and key influencers.

Spencer (1998) said members of NSMs learn together to identify the issues, to seek out the knowledge needed, and to develop a plan to bring about change. Within NSMs, learning goes on all time. The processes of learning spills over into social action and ranges across multidisciplinary areas, which include developing people skills, processing information, and initiating and planning social action.

Knowledge translation, mobilization and transfer

Knowledge mobilization is the stage of the process where relevant knowledge, having been translated, is assembled or mobilized as a prelude to formal transfer (Gordon, 2008). Knowledge mobilization involves making knowledge readily accessible and thereby useful to any number of individuals and groups in society, by developing ways in which groups can work together collaboratively to produce and share knowledge.

It is, says Gordon (2008), a social process, involving research users at all levels of

socially organized communities, governments and businesses.
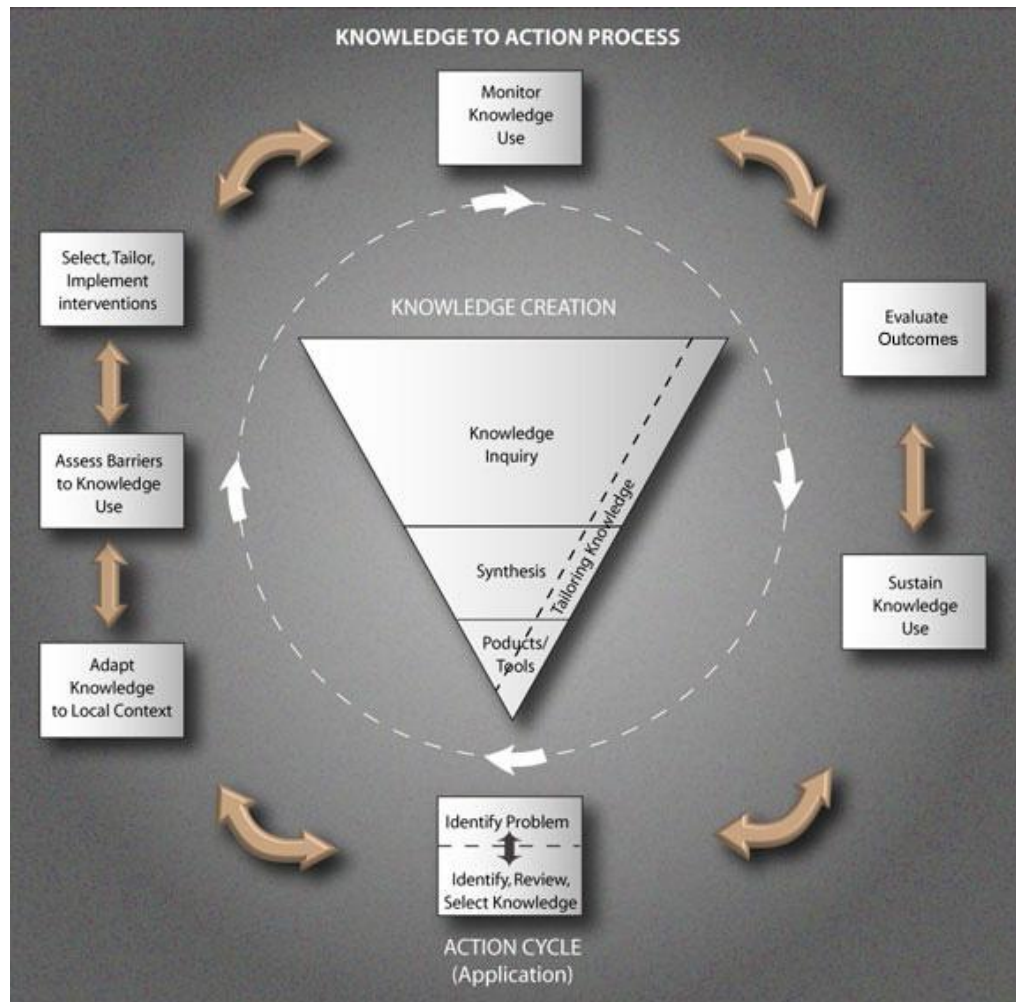
Figure 4. Knowledge to action process. SPARK may be seen as a tool in knowledge creation, but it also has a central role in knowledge inquiry (asking questions) and knowledge synthesis (writing stories, shooting video, blogging, etc) Canadian Institutes for Health Research (2010).

Meyer (2010) described the role of individuals called knowledge brokers, people

or organizations that move knowledge around and create connections between

researchers and their various audiences. Sverrisson (2001) called knowledge brokers

persons or organizations that facilitate the creation, sharing and use of knowledge. Wenger (1998) said brokering involves translation, coordination and alignment between perspectives, and requires the ability to link practices by facilitating transactions between them.

A criticism of knowledge transfer systems, particularly in their traditional from as technology transfer, has been their lack of feedback. Evans (J. Evans, personal communications, April 10, 2010) said systems without a feedback mechanism have been characterized as one-way, top down and sender-oriented. He said the meaningful participation of audiences has emerged as a major theme to help offset the problems often revealed by development approaches that are based on a philosophy of "sender knows best." Social communication may quell that stigma, by offering new possibilities for audience participation though its feedback mechanisms.

Qualitative research

Denzin and Lincoln (1994) said qualitative research is a situated activity that locates the researcher in the world, and consists of a set of interpretive practices that makes the world visible. Strauss and Corbin (1998) defined qualitative researcher as any type of research that produces findings not arrived at by statistical procedures or other means of quantification. This type of research offers insights into feelings, thought processes and emotions that might not be obtained through a quantitative study, although Hatch (2002) said sample sizes are generally small and rarely represent the entire population.

Bogdan and Biklen (1998) said qualitative research, and those who engage in it, typically have five distinguishing features. First, the natural setting is the direct source of

data, and the researcher is the key instrument. Second, qualitative data are collected in

the form of words or pictures, rather than numbers. Third, qualitative researchers are

concerned with the process as well as the product. Fourth, qualitative researchers tend to

analyze their data inductively, "constructing a picture that takes shape as they collect and

examine its parts" (page 430). And finally, how people make sense of their lives is a

major concern to qualitative researchers.

Chapter III

Methodology

Purpose of the study

The purpose of this study was to determine students' potential role in a knowledge translation and transfer system in Ontario, and ultimately to develop a model describing that role. The hypothesis was that students can be an intrinsic part of translating and transferring information, based on factors such as their proximity to researchers, their participation in the program Students Promoting Awareness of Research Knowledge (SPARK) and the training they receive, the significant uptake of knowledge translated and transferred through SPARK, and the connections they make with the media, industry and government.

Research questions

The study was guided by four research questions:

1. How does the SPARK program affect participants' career decisions and employers' hiring decisions?

2. What are the successes and limitations of SPARK, and its potential for replication elsewhere?

3. What is SPARK's current and potential role in knowledge translation and transfer?

4. Is SPARK part of a new social movement of science-literate members of society?

Study design

This research study was based on qualitative research. This study focused on a clinical approach, using focus groups as a scientific construct to gather knowledge for clinical judgments, with the ultimate goal being to describe a model for student learning in knowledge translation and transfer in Ontario. Chalofsky (1999) called focus groups "carefully planned group meetings designed to collect perceptions and information on a defined area of interest" (p. 1). Calder (1997) described three approaches to qualitative research, and more specifically to focus group research: exploratory (to acquire pre-scientific knowledge), clinical (which yields quasi-scientific knowledge by using existing scientific constructs and theories to arrive at clinical judgments), and phenomenological (which is concerned with everyday knowledge from the shared perceptions of particularly respondent subgroups).

The sampling of the SPARK participants was what Fraenkel and Wallen (2006) described as typical (judged to be representative of those being studied), homogeneous (in which all members possess a certain trait or characteristic), and theoretical (one that helps the researcher understand a concept or theory). The SPARK research subjects ($n = 9$) were typical insomuch as they were not unlike others who had participated in the SPARK program. They had joined as writers, and only in one case had they gone on to become senior student writers, editing other participants' work (this position was discontinued when the program grew and hired a coordinator, in the early 2005). They were homogeneous because they all possessed a certain trait, that being their participation in the SPARK program. And they would be considered representative of theoretical sampling as well, because they, as well as the stakeholders' group ($n = 10$), were invited

to participate to try to describe the concept of SPARK. The SPARK stakeholder research

subjects were likewise typical of a broader group because they had experience dealing

with SPARK as administrators, funders or users of SPARK output through the

knowledge transfer process. They were also homogeneous, because they possessed the

singular characteristic of having been associated with SPARK in capacities other than as

participants.

Procedure

Two two-hour focus groups were held in the boardroom of the Ontario

Agricultural College on the University of Guelph campus, two weeks apart. University

of Guelph Research Ethics Board certification of ethical acceptability of research

involving human subjects, number 09OC018 (Appendix L) and Texas Tech University

Protection of Human Subjects Committee number 502233 (Appendix M) were granted.

At the University of Guelph, the ethics board grants approval to graduate students'

supervising faculty, rather than to the graduate students themselves. In this case, the

approval was given to a professional facilitator who is also a professor emeritus at the

university.[1] The facilitator was secured to moderate the focus groups, to ensure

confidentiality and promote open discussion.

The facilitator's approach to recording proceedings is what he calls as-it-was-

heard recording (M. Waldron, personal communication, October 12, 2009). This method

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[1] Dr. Mark Waldron was the researcher's Master's of Science advisor at the University of Guelph, and now holds emeritus status in the School of Environmental Design and Rural Development. He has professionally facilitated an estimated 200 focus groups across Canada, mainly for groups involved with agriculture, development or spirituality.

eschews electronic (tape or digital) recording in favour of verbatim recording of comments on a free standing flip chart. The facilitator created this approach in 2000, while facilitating a nationwide series of eight focus group meetings on program planning for the Canadian government. The time zone differences were appreciable between some of the meeting locales and the nation's capital (Ottawa), where the focus group dialogue was being scrutinized, and the facilitator was required to file the results unedited as quickly as possible. This led him to the as-it-was-heard approach, which allowed him to report almost immediately (for example, "as it was heard an hour ago") on the focus group activity, without having the arduous task of reviewing tape- or digital recordings. The facilitator further came to believe this method made participants more comfortable than electronic recording, because they could immediately and permanently see how their comments were being interpreted or recorded. Another advantage of the as-it-was-heard approach was that it represented another way to alleviate the potential for the research subjects to be identified personally, and thus be subject to researcher bias. For this study, identification was a confidentiality concern of the university's Research Ethics Board, because two of the research subjects are employed by the researcher. The board was concerned about what its director calls power-over relationships (S. Ault, personal communication, October 3, 2009), and requires that if present, power imbalances between researchers and participants be acknowledged and addressed (University of Guelph, 2010). Dooley (2007) said qualitative researchers must take special precautions to avoid biases and ensure that the findings are indeed the words, feelings and beliefs of the respondents.

Instrumentation

The focus groups were contacted by email (Appendices H & I) and in some cases by telephone. They were each given direction by a four-page, 14-question moderator's guide (Appendices C & D). Questions were developed and tested prior to the focus groups using experts familiar in focus group methodology and the topic of study, to assess the face validity and clarity of the questions.

Questioning route

The questioning route was designed to take the focus group participants from rote comfort and familiarity (recounting their experiences, discussing the elements of a successful SPARK program, etc.) to higher-level thinking, challenging participants by inviting them to draw a SPARK model, and by asking them to see SPARK in the context of a broader social movement of communications- and knowledge-literate young people. For triangulation, a combination of approaches was used to gather data, those being a rich verbal description of the SPARK program, a visual model which the research subjects were asked to construct individually in the focus groups, and the researcher's observations of the program after creating it and administering it for twenty years. Bryman (n.d.) said triangulation, using more than one approach to investigate a research question, enhances confidence in the findings. Further, methodological triangulation, the approach used in this study, refers specifically to the use of more than one method for gathering data.

Subject selection

Two focus groups were held. The first focus group ($n = 9$) consisted of seven former SPARK participants and two current participants. Gender representation was two

males and eight females, mirroring the usual gender participation in SPARK and to a

lesser but applicable extent, reflecting the gender make up of the University of Guelph,

both of which are predominantly female. The participants were selected from a

population of approximately 200 former SPARK participants. Their selection was

purposive, based on diversity of occupations and availability. Kerlinger (1986) says

purposive sampling is characterized by the researcher's use of judgment and a deliberate

effort to obtain representative samples. Palys (2008) says purposive sampling is virtually

synonymous with qualitative research.

Table 1

Subject Description, SPARK Participants Focus Group (n = 9)

Participant number	Academic program	Current employment	SPARK experience (yrs)
1	B.Sc. Biochemistry	Freelance medical writer, consultant	3.00
2	B.Sc. Agriculture	Communication and livestock coordinator, national outdoor farm show	1.00
3	B.Sc. Animal Biology	Communications associate, international crop protection company	2.00
4	B.Sc. Biophysics	SPARK program participant, Ph.D. candidate	2.00
5	B.Sc. Animal Biology, M.Sc., Animal Nutrition	Editor, national poultry magazine	3.00
6	Student, 2nd year English	SPARK program participant	0.58
7	B.Sc., Agricultural Science; Diploma, Agricultural Communication	Freelance writer	1.00
8	B.Sc. Zoology	High school science teacher	1.00
9	B.A., English	Communications manager, food technology centre	3.00

Of the seven former participants, six held the degree of Bachelor of Science. Two

majored in animal biology while the others majored in biochemistry, zoology,

agriculture, agricultural science and biophysics. One also had a Master's degree in

animal nutrition. Of the two current SPARK participants, one is in the second year of an

English degree, and the other is a doctor of philosophy candidate in biophysics, who

started his association with SPARK as an undergraduate five years earlier. On average,

the participants had 2.1 years of experience with SPARK, with a range from seven

months to five years.

The second focus group consisted of SPARK program stakeholders ($n = 10$).

Palys (2008) says stakeholder sampling is particularly useful in the context of evaluation

research and policy analysis. It involves identifying the major stakeholders involved in

designing, giving, receiving, or administering the program or service being evaluated,

and who might otherwise be affected by it.

Table 2

Subject Description, SPARK Stakeholders Focus Group (n = 10).

Participant number	Position/occupation	Years associated with SPARK
1	Interactive news editor, agricultural news portal	3.00
2	Editor, agricultural weekly newspaper	11.00
3	President, public relations company specializing in agriculture and food	20.00
4	President, agricultural marketing company	18.00
5	Financial manager, provincial ministry of agriculture, food and rural affairs	20.00
6	Director, equine education program	7.00
7	Director, communications and regulatory affairs, provincial food processors' alliance	9.00
8	Director, government and public affairs, international crop protection company	11.00
9	Senior editor, national daily newspaper	16.00
10	Senior public relations specialist, global communications company	20.00

The stakeholders' associations with SPARK varied, from having hired former SPARK participants, to helping support the program with funding, administration and/or mentorship. They represented a diversity of occupations. One was a senior editor for Canada's largest daily newspaper, based in Toronto, Ontario. Previously, this participant was an editor at the Guelph daily newspaper and had worked with SPARK administrators to develop a weekly bylined news story in the newspaper about University of Guelph

research. Another participant was the editor of Ontario's biggest weekly farm newspaper and the former president of the Canadian Farm Writers Federation, who has hired former SPARK participants as freelancers. Others included a former SPARK participant who was the government affairs manager for a multi-national crop protection company which has helped fund SPARK and hire former participants, and the government affairs and communications manager for a food processing lobby group, who helped develop a regular SPARK research story in one of Ontario's major agricultural commodity magazines, in her prior job there as editor.

Two stakeholders owned life sciences communications and marketing companies and had both hired former SPARK participants, while a third was the editorial manager for an agricultural marketing company and had mentored SPARK students. Another stakeholder participant was the interactive media manager for an agricultural web portal and worked with SPARK on video production in his current capacity, and on podcasts in a previous role as farm editor for a radio station in Ontario's beef- and dairy producing belt. One participant had hired SPARK writers to produce a research magazine about equine studies, while serving as manager of the university's equine centre. The final member of the group was a senior financial administrator with Ontario's ministry of agriculture, food and rural affairs, who formerly held the same position at the University of Guelph and administered SPARK funding.

The stakeholders' average association with the program was almost 13 years. In three cases, stakeholders had been associated with the program for 20 years, since its inception.

Validity and reliability

Four popular measures were used to guide the validity and reliability of the study: credibility, transferability, dependability and confirmability. Trochim (2006) says credibility involves establishing that the results of qualitative research are credible or believable, from the perspective of the participant in the research. Merriam (1998) said due diligence dictates among the approaches used to assure credibility is member checks, and for a colleague to be consulted throughout analysis process. In this study, the focus group facilitator was engaged to review the coding process with the researcher. Study participants were given the immediate opportunity for member checks through the as-it-was-heard data collection process, in which whatever is written on flipcharts by the facilitator's assistant during the proceedings, and is clearly in the view of the members, serving as the transcription record. The as-it-was-heard process also promotes dependability by ensuring what was transcribed is indeed what is used by the researcher for the study, particularly with the focus group facilitator likewise serving as a coding and data check.

Trochim (2006) says qualitative researchers can enhance transferability by doing a thorough job of describing the research context, and the assumptions that were central to the research. The person who wishes to transfer the results to a different context is then responsible for making the judgment of how sensible the transfer is. For this study, the research context was explained through the lens of knowledge translation and transfer, with the judgment being that it is sensible to make that transfer if a model is offered as guidance. The model is intended to enhance not only transferability but

conformity as well. Others who adopt the model have the opportunity to have shared experiences and success if they conform to its parameters.

A data audit was conducted with the facilitator to examine the data collection and analysis procedures, and make judgments about the potential for bias or distortion. Following data collection, the participants' remarks were transcribed by the facilitator, and coded by the researcher (see Appendices N & O). Merriam (1998) said coding occurs at two levels; those are, identifying information about the data, and interpretive constructs related to analysis. Trochim (2006) said coding categorizes qualitative data. In this study's case, it informs the model.

Initially, open coding was conducted, in which the data was considered in minute detail while developing initial categories. Open coding helped assemble the data into segments that began to help identify patterns and common responses. Axial coding followed to create related categories. Finally, selective coding was pursued, with respect to the study's core concepts of skill development and knowledge translation and transfer. The model itself describes SPARK's role as a student learning exercise in the knowledge translation and transfer process.

Chapter IV

Results

Purpose of the study

The purpose of this study was to determine students' potential role in a knowledge translation and transfer system in Ontario, and ultimately to develop a model describing that role. The hypothesis was that students can be an intrinsic part of translating and transferring information, based on factors such as their proximity to researchers, their participation in the program Students Promoting Awareness of Research Knowledge (SPARK) and the training they receive, the significant uptake of knowledge translated and transferred through SPARK, and the connections they make with the media, industry and government.

Research questions

The study was guided by four research questions:

1. How does the SPARK program affect participants' career decisions and employers' hiring decisions?

2. What are the successes and limitations of SPARK, and its potential for replication elsewhere?

3. What is SPARK's current and potential role in knowledge translation and transfer?

4. Is SPARK part of a new social movement of science-literate members of society?

Responses from SPARK participants

Research question one

The first objective was to describe how the SPARK program affected participants (i.e., the research subjects). This included gathering the participants' impressions of the program and memorable moments (questions 1, 2 and 5), the skills they acquired (question 4), the program's effect on their career decisions (question 3) and its influence on them culturally (question 13).

Participants said SPARK's strengths are mostly practical in nature: creating opportunities for students to learn on the job, connecting students with the broader community, giving students practical experience, providing students with skill development in the practical aspects of being a communicator, and building a student's portfolio and resume. One participant said SPARK afforded them the "confidence to know that I could write and [I] found that there were jobs in the field of communication." Another said "as an English major, I discovered that there were other ways of writing than 'novel' writing and it opened a new world of possibilities for communicating." Another said they "learned about the power of technology transfer and about a new job field." Another said SPARK "gave me some cash…and the actual writing led to my future job."

Individual benefits to participants

SPARK participants saw several benefits arise from the program, though the responses varied widely. Three participants primarily described journalism skills, such as interviewing skills, "using effective language," "taking myself out of a story" (i.e., objectivity), "writing skills and the ability to capture an audience," "cutting fluff, getting

to the main message" and "getting rid of vague language and psyching out the real message." Two saw their skills as a maturing or development touchstone, citing "networking, professionalism and leadership, self confidence, growing up and being dropped into responsibility," as well as "project management skills, learn(ing) ideas that are important to adults and develop(ing) respect for other communicators and for researchers." Another described working under pressure as an acquired skill, along with teamwork and oral communication skills development.

External benefits

Several participants specifically said they used their newfound SPARK skills for the betterment of their community. One said the skills they learned had a ripple effect when the participant shared those skills in volunteer capacities. Another considered SPARK a public service, for its role in showing the importance of research to the community at large. Another participant saw SPARK "as an investment in young people," allowing them to "reap rewards and to give back to society." Another said that "from the cultural perspective, SPARK helps students learn different approaches to people and show the community what is going on in research. This helps avoid the ivory tower syndrome and breaks down barriers between researchers and the public." One participant described the skill set acquired at SPARK as being "valuable in the real world where success depends on individual skills. It broadens one's own perspective and shows practical applications." Further to that perspective, another participant said SPARK "provides an opportunity to work with a cross section of students."

Measures of success

The participants' impressions were that SPARK has been successful. "We can

measure the success by seeing the quality of the writing and where the stories are published and where the information is picked up by other media," said one participant. "We can also measure its success by how well known it is on campus," said another participant. Another participant said success can also be measured "by how many of us get good jobs."

Research question two

The second objective was to find what the focus group participants believed were the successes and limitations of SPARK (question 8), and the program's potential for replication elsewhere (question 12). It included items other institutions should know about SPARK before starting their own program (question 10), whether students should be paid (question 7), if sponsorship influences the program (question 6), and what they considered parts of a SPARK model (question 11).

Success-related factors

The SPARK participants' description of program elements included a dedicated leader/mentor (see Appendix F), student writers, funding, researchers, industry participants, media participants and targeted audiences. All nine participants said other institutions need to know that SPARK's success hinges on a dedicated leader. This role was variously described as "a teacher to help students learn writing style and professionalism," a trained journalist, recruiter and trainer, someone to make industry connections, head and coordinator. One said the leader must have "contact at many different levels and good relationships with others." Another cited connections with "industry, funding and research" as being important.

Similarly, industry connections (including media) and were cited separately by five participants for their importance. Some of these responses included "avenues for publication," "willing publications," and "companies to fund and magazines to publish." Other responses included a commitment by the institution to support SPARK, variously described as "administrative support for infrastructure" (dedicated space and technological and financial resources for SPARK), "university buy-in," "university commitment," "story leads and buy-in from faculty," "proper foundation" and "a newsroom work environment which gives students a 'real world' experience." One respondent said the university's support of a SPARK newsroom gives the program "legitimacy" and gives students a physical locale at which they can interact, which several (3) listed as important. Other individual responses related to opinions about what makes SPARK succeed included a strong connection to the university's corporate communications office ("internal/external relations"), "constant re-evaluation and improvement," and "interesting, innovative, relevant research taking place," suggesting that universities lacking a strong research program will not succeed with SPARK programs.

Another key to success, according to the participants, was being paid for their work. "It was the dollars that got me in the door," said one participant. Another participant said "it mattered that we got paid. Students are short of time and money. The small amount of money that we got as pay meant a lot to us." Another participant said they would not have committed as much time to SPARK if they were not being paid. Another participant said "receiving payment gave us professional dignity as well as helping set a priority in terms of scheduling time. It also gave us respect on campus."

Only one participant was adamant ("yes, yes, yes!") that they would participate if they were not paid. Another participant said initially money was not important, but that changed later: "When I applied, it wasn't important to be paid, but once I got doing the job, it was important to be paid." Another participant said "we probably would have participated without being paid, but the pay was important in that it gave us a feeling of being valued. It made us feel professional, when paid, and kept us motivated. It was only later that I realized the value of the experience beyond the dollars."

Implications of sponsorship and funding

SPARK participants are paid for their work, from both internal and external sources, which the program refers to as sponsorship. Some participants felt sponsorship funding compromised their objectivity, even if the funding came from the university. "We are the general propaganda department," said one participant. Another participant was concerned about agri-food industry sponsorship. "In doing a video using Monsanto, there was concern about such a connection in terms of future employment and that gave me an 'iffy' feeling sometimes," the participant said.

For the most part, industry support was not considered a problem. "Industry only provided general support for the program which sometimes affirmed the program such as with the support of the Dairy Farmers [of Ontario]," said one participant. Another participant said support was transparent: "There is no problem in having industry support as long as there is no interference on the output." Two participants welcomed the industry support. One said "the University is often thought to be 'left wing', we don't often hear the other side, a different viewpoint [from] industry," while another participant said "in reality, the funding helps in our skill development." One participant said

influence was not obvious. "Companies contribute as sponsorship but that is not really known to students, to any extent," the participant said.

In fact, one participant considered the *lack* of funding to be a weakness of the program, while another participant suggested looking beyond the agri-food sector for funding and for editorial material. One participant said the lack of awareness from Guelph professors about SPARK was a problem. "It doesn't promote itself," said the participant, and as a result, some stakeholders, such as professors, don't know about some of its products, such as the *Research* magazine. Another participant thought the publications may not be well known because of the erratic publishing schedule. Another participant said the narrow administrative base is a weakness. "This is really Owen's project and would not stand alone without his leadership," according to the participant.

The first byline

Participants' memorable moments were related to new experiences, awakenings and media exposure. One participant remembered having a story published in the *Globe and Mail*, Canada's main business newspaper, and then winning a top award for best daily reporting from the Canadian Farm Writers Federation. "That added mileage to my resume," the participant said. Likewise, although on a lesser scale, another participant remembered "getting my first article published. It was a momentous experience." Another participant remembered the buzz around the newsroom, and how "it was really exciting each time a story was published and picked up by other publications, radio and TV at the national level." Another participant said experiencing media beyond traditional print was the most memorable experience: "I had to do a story on a particular process for coffee production when I saw, first hand, the production of a TV clip so I saw the

different focus and was able to compare the communication process by print with film."

Other participants remember the realization of new responsibility. "It was my first day at SPARK when I was reading the handbook and realized it was 'baptism by fire' as I thought about who will train me? I will have to deal with the real world with no real training and how will I cope?" However, another participant embraced the independent nature of SPARK involvement, saying "I was given a job to do; I was expected to do it well. The experience set me up with the right attitude when on my first job."

Experience-based models

Based on their SPARK experiences, participants were asked to draw a SPARK model (question 9). Each participant was given a blank piece of paper and a marker, and asked to work independently for approximately 10 minutes. Specifically, they were asked to graphically show who is involved in SPARK, and who is impacted by SPARK. Their models were as follows:
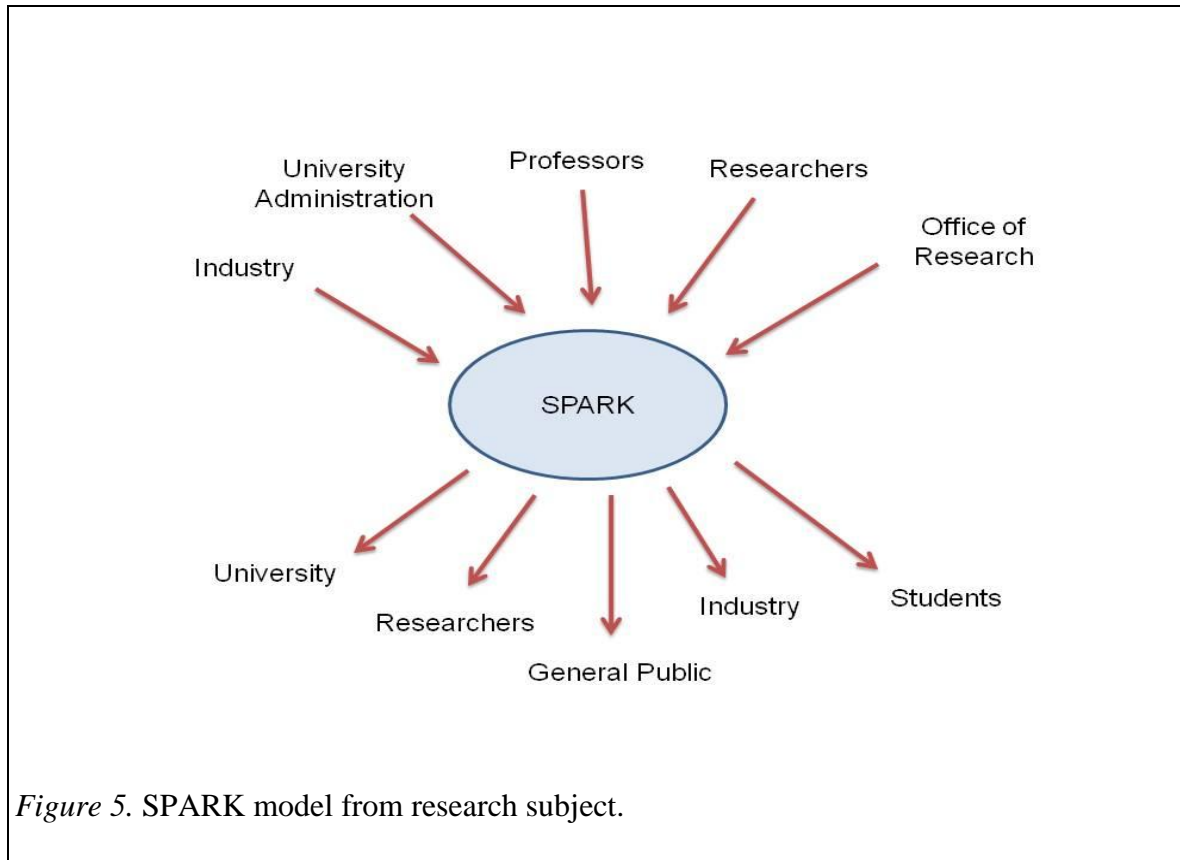
Figure 5. SPARK model from research subject.

In Figure 5, arrows enter SPARK showing how the program receives input,

stimuli and support from various sources, including industry, professors/researchers and

university administration. Its communications output, shown by arrows leaving SPARK,

is directed to stakeholders such as the university community, the public, industry,

researchers and other students. This model puts SPARK between knowledge creators

and knowledge users, and does not provide a feedback mechanism between SPARK and

stakeholders. Influencers and stakeholders are treated uniformly, with none having a

more prominent role than another. Having students included in the impact portion of the

diagram suggests this subject believes SPARK connects to other young people.
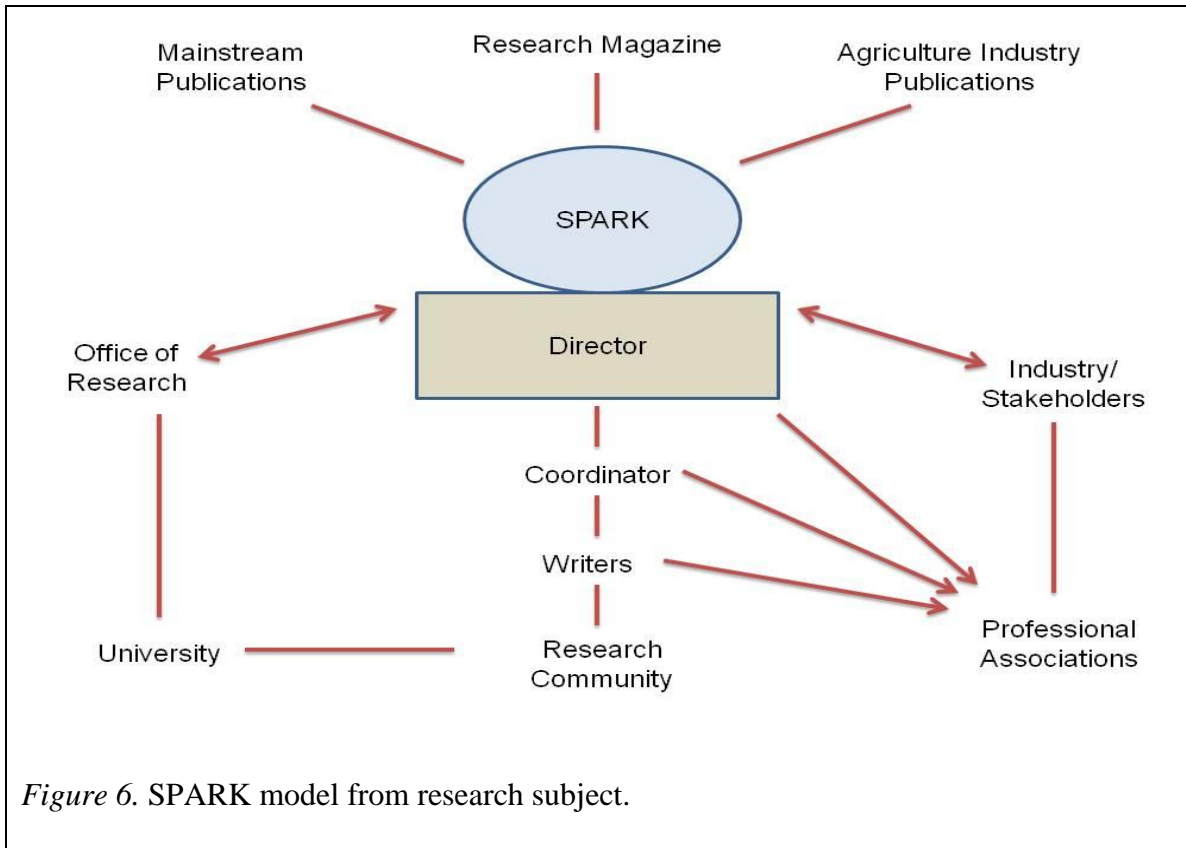
Figure 6. SPARK model from research subject.

The model in Figure 6 takes a ground up approach, with the research community

connected to the university at its foundation. A line is drawn between the research

community, writers (i.e., journalists) and the SPARK coordinator, who, along with the

director of research communications, are seen by the research subject as participants in

professional associations. These associations are joined by a straight line to industry

stakeholders. For its part, SPARK is near the top of the diagram, connected externally to

stakeholders through mainstream publications and agriculture industry publications. The

University of Guelph's *Research* magazine, which is written entirely by SPARK writers,

is prominent in this SPARK diagram.
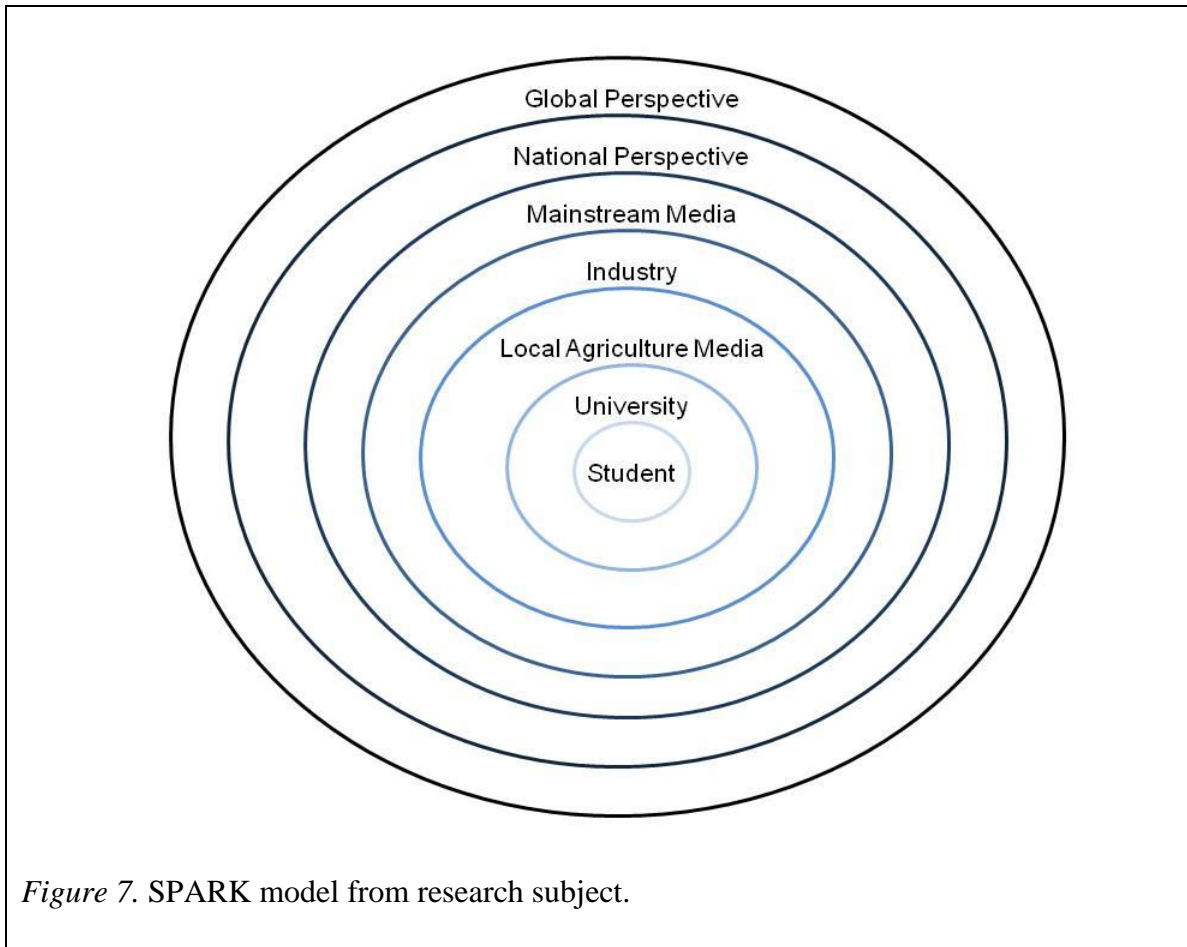
Figure 7. SPARK model from research subject.

SPARK does not get mentioned by name in Figure 7, but is identified instead by the term *student*, which is at the center of this radiating circle. *University* is the first level of impact, with *industry* sandwiched between *agriculture media* and *mainstream media*. SPARK, through the research stories its members write, has a national and global perspective, according to this model's author.
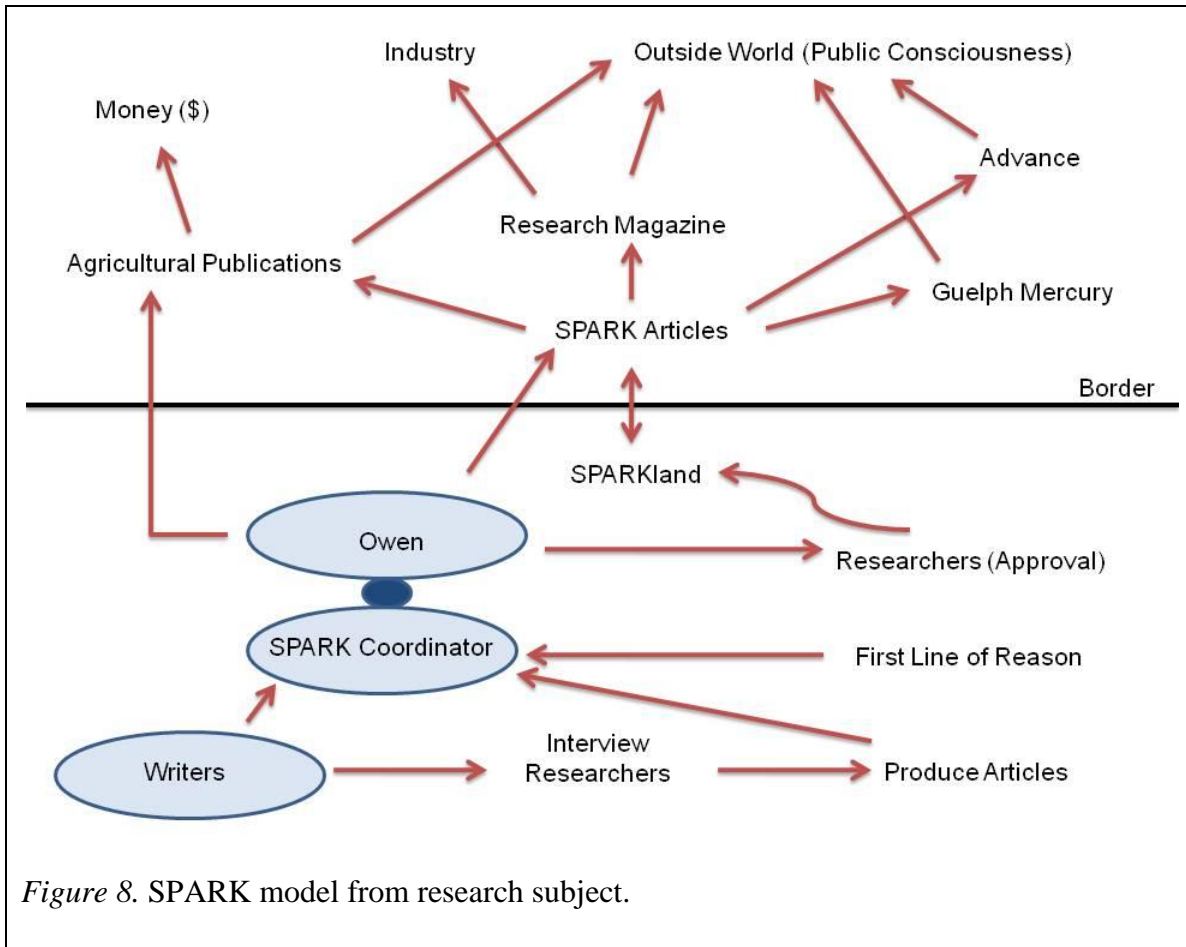
Figure 8. SPARK model from research subject.

In Figure 8, a *border* or line is drawn between internal activty at SPARK, and the transfer of SPARK-generated knowledge off campus. The SPARK writing process is outlined in detail, showing SPARK (called *writers*) interviewing researchers and producing stories that are submitted to the SPARK coordinator and research communications director (*Owen*) for editing before going back to researchers for approval. Then, the stories are released externally (passing the *border*) to various media outlets, feeding what the author calls *public consciousness* and generating financial support for SPARK when the stories are published in farm magazines.
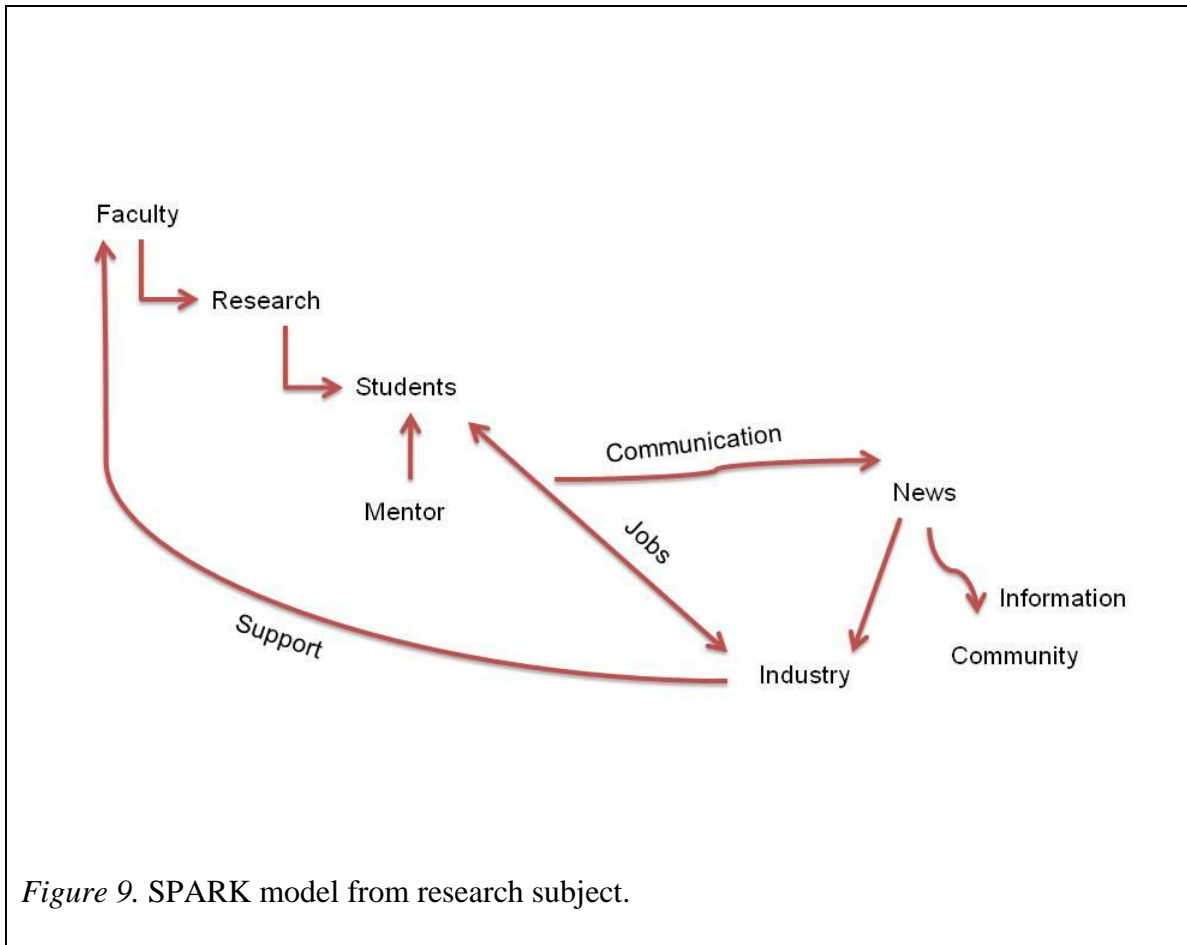
Figure 9. SPARK model from research subject.

The faculty-centric diagram represented by Figure 9 shows industry supporting

faculty research activity as a result of receiving news about that research via SPARK

(shown as *students*). SPARK also informs the public (*community*) in this figure, through

communication that ultimately develops into news, and shows an employment connection

between SPARK and industry. The SPARK mentor features prominently in a supportive

role to the SPARK participants.
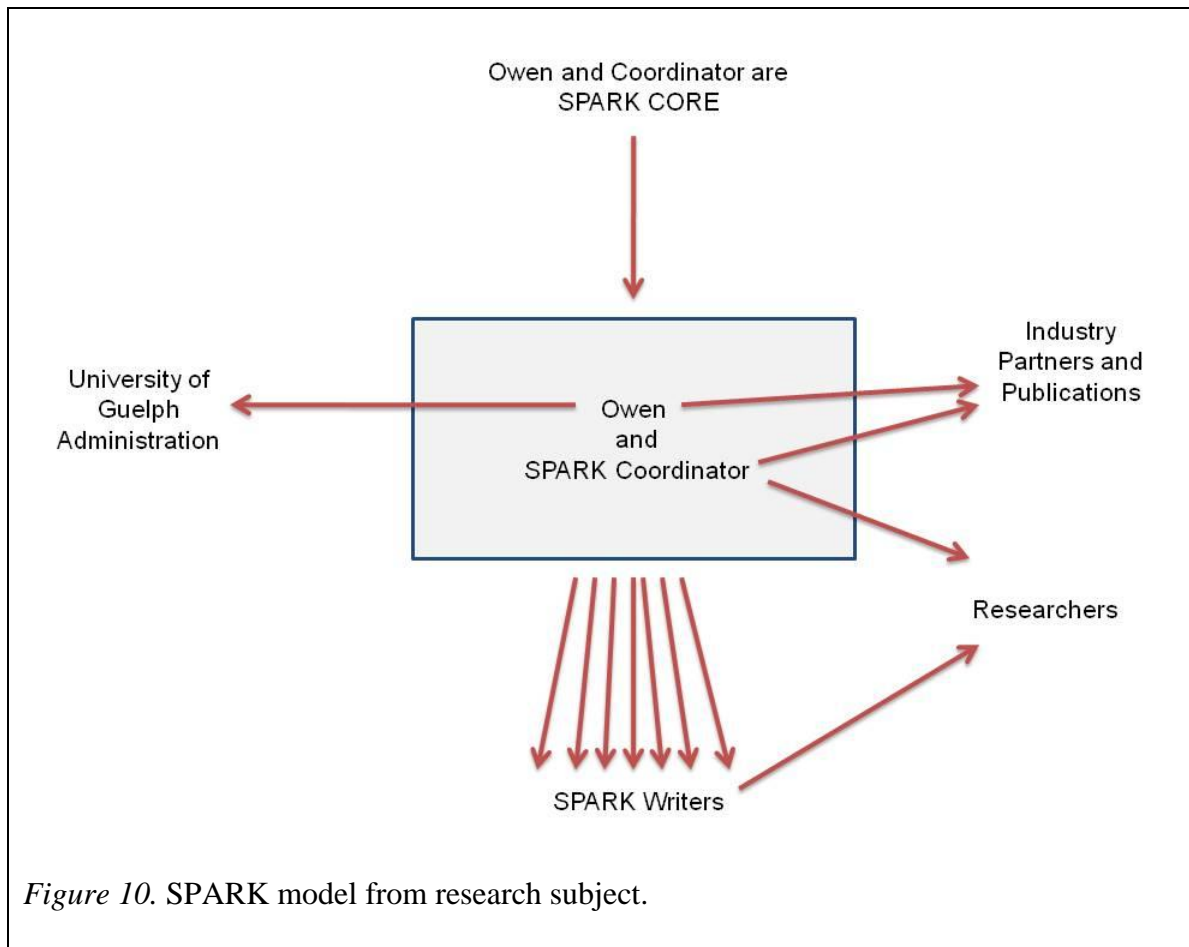
Figure 10. SPARK model from research subject.

The SPARK coordinator and director (*Owen*) are at the center of Figure 10, above

the line up of SPARK writers who connect with researchers. The SPARK coordinator

connects with researchers as well to monitor research developments, and along with the

director, develops partnerships with industry/stakeholders and mainly commodity

publications. A direct connection is also shown with Univesity of Gueph administration,

which provide some of the infrastructure and support for SPARK.
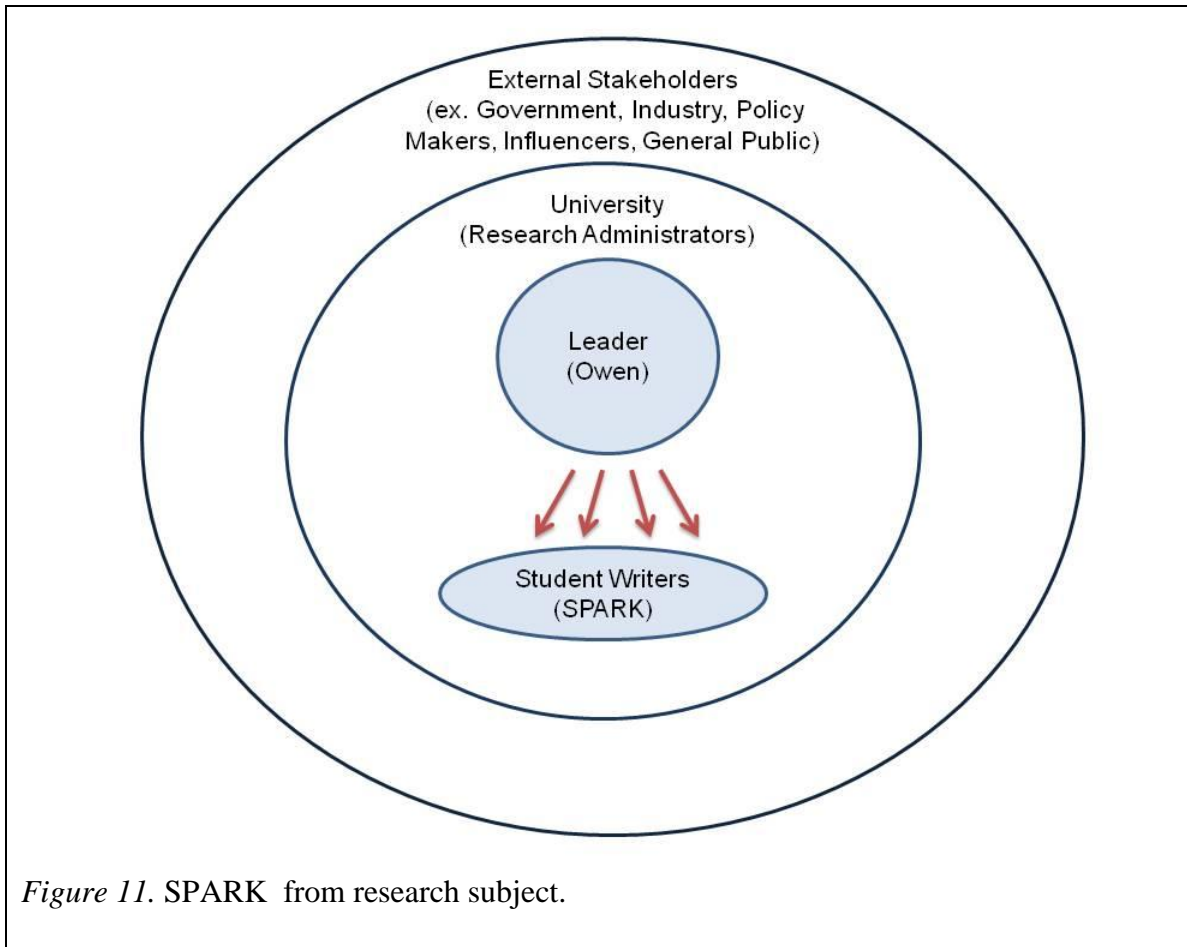
Figure 11. SPARK from research subject.

The author underlines the dominant role of the SPARK director (*Leader*) by

showing the centeredness of the director's position and the direction given to the SPARK

writers, in Figure 11. The director and the SPARK writers work within an environment

populated by research administrators. The periphery is surrounded by myriad external

stakeholders, including the public, policy makers, influencers, government and industry.

Figure 12. SPARK model from research subject.
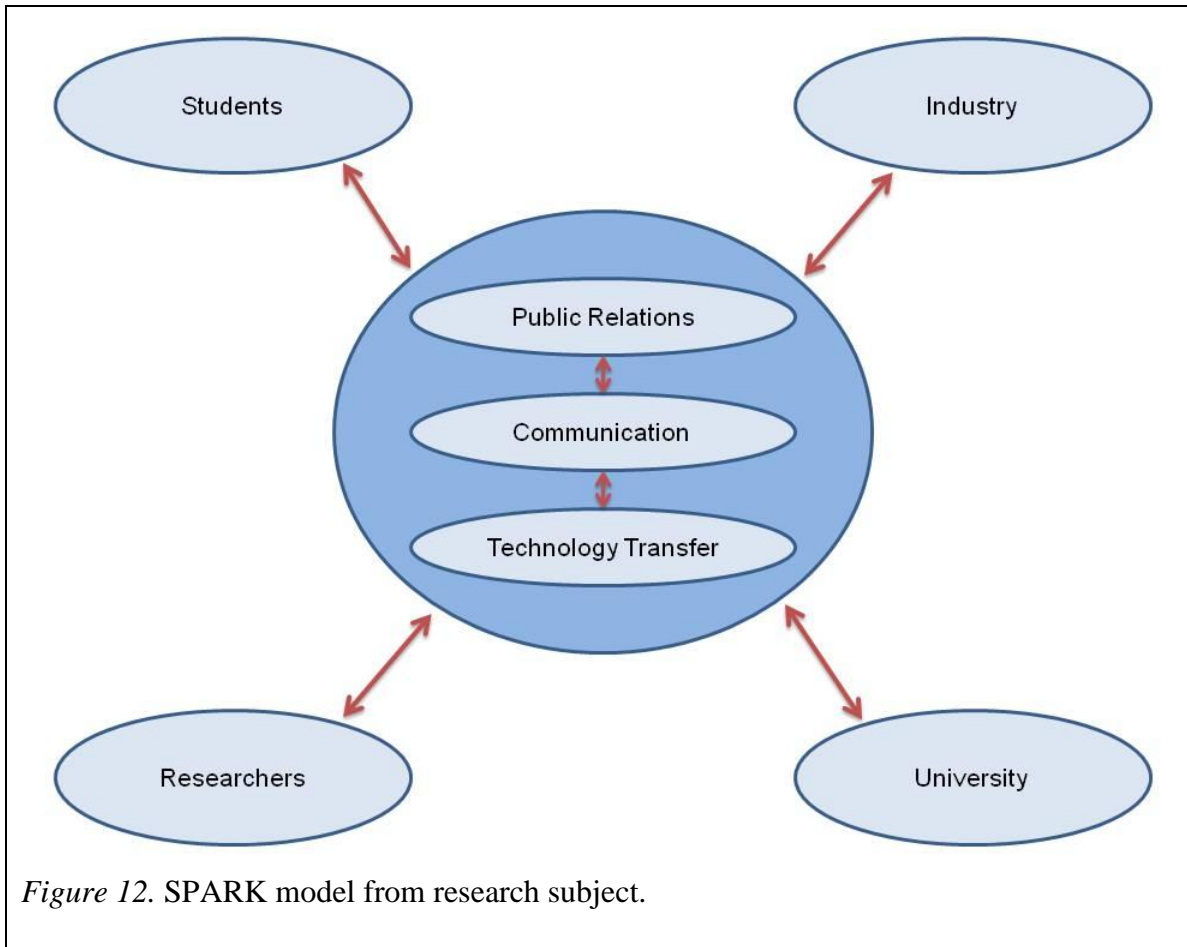
As with Figure 5, students are an external stakeholder in this SPARK model (Figure 12), along with industry, the University of Guelph and researchers. Feedback occurs between external stakeholders and SPARK within the center sphere, where connectivity occurs between activities such as public relations, communication and technology transfer. These are all skills learned by SPARK participants.
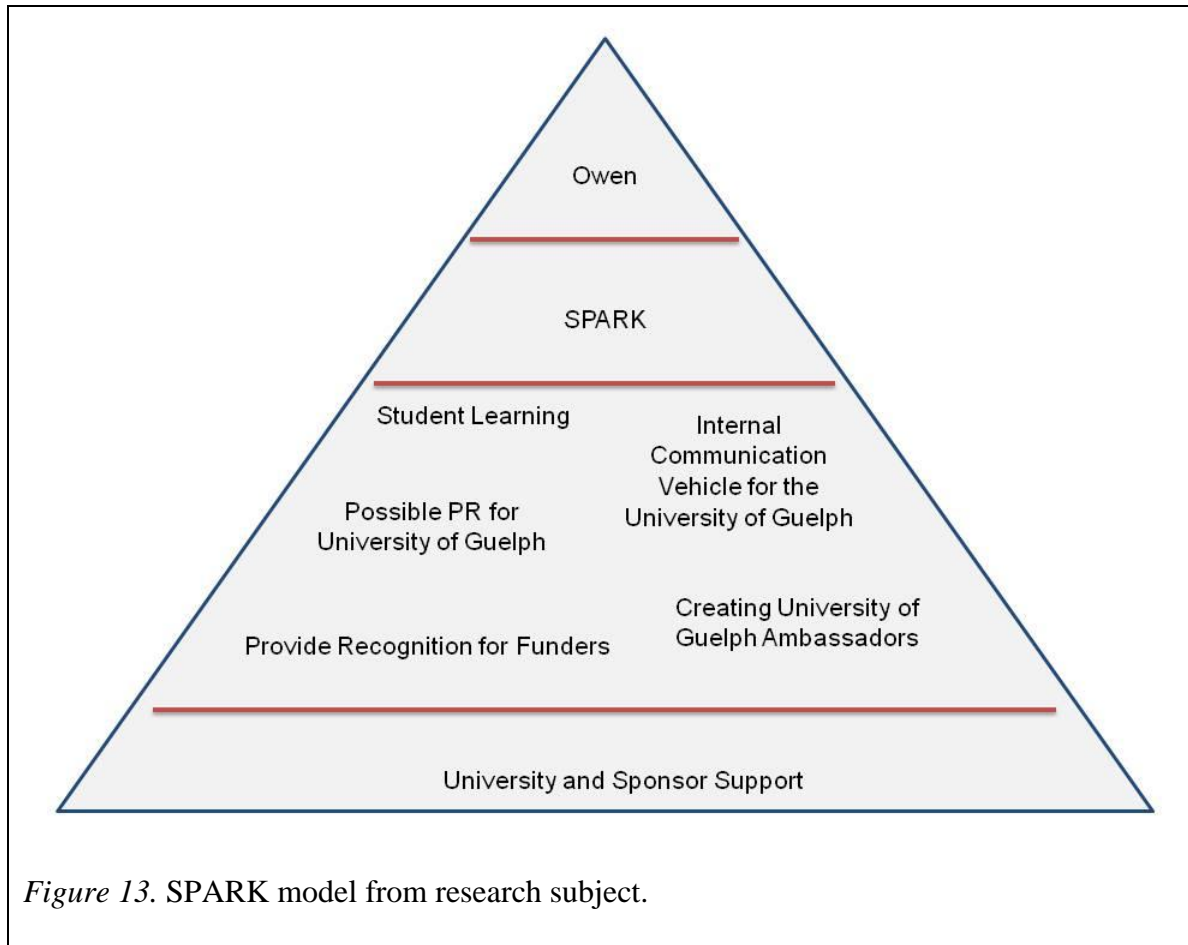
Figure 13. SPARK model from research subject.

The University of Guelph and SPARK sponsors anchor this SPARK participant's perception of the program, in Figure 13. The second-last section from the bottom cites a collection of benefits accrued by SPARK writers, sponsors and the University of Guelph. SPARK and the mentor/director (*Owen*) are at the pinnacle of this pyramid, which is solid because the foundation is wide.

Research question three

The third objective was to evaluate SPARK's current and potential role in knowledge translation and transfer (questions 16 & 17), to examine whether it was indeed a role for students, or professionals, and where in the innovation diffusion process SPARK should concentrate its knowledge translation and transfer efforts.

Knowledge translation and transfer

For the most part, participants agreed SPARK students had a role in the knowledge translation and transfer process. Their opinions were based on SPARK participants' ability to communicate clearly to a wide audience, and to bring an enthusiastic but impartial perspective to a story. One participant said "students have 'innocent curiosity', a joy of discovery and energy." Another said "students are good at handling the gap between professional terms and 'everyday' terms." Likewise, another participant said "researchers don't have time to communicate information. They can't really communicate or translate ideas into everyday terms." Another participant liked the profile of "students and professors working together such as [on] SPARK articles in the *Globe and Mail*."

However, one participant called into question students' professionalism in regards to knowledge translation and transfer. "There is not the same dedication by non-professionals," the participant said. Another said there is a "question of credibility" with students, who are by definition not full-time professional communicators.

But some participants said it did not matter if the writers were students or professionals, "good science writers/journalists get it right away." Another participant spoke in favour of students being involved in knowledge translation and transfer because "they don't have a long term bias. It is a continuum and everyone starts someplace." Another participant said checks and balances are in place to ensure mistakes are minimized. "Articles are edited and approved [by researchers]; they are not lacking in professionalism," according to the participant. Another participant said knowledge translation and transfer aimed at youth could actually be aided by SPARK involvement in

the process. "It could mean that articles are picked up by a young audience when written by students," the participant said.

Participants said SPARK could advance knowledge translation and transfer by branching out into other areas and publish articles in other areas, specifically mentioning the arts, theatre and history. One participant said SPARK could use other media, on-line media, and other means of publishing: "Publishing companies are looking for material. Items could use more multi-media, radio, television, for delivery." Another participant spoke specifically of transferring technology through radio, and broad medium domestically and internationally.

One participant said SPARK "could get people talking about agriculture." Yet another said it would be a boon if SPARK communications were "sent to high schools, especially science teachers. Research articles are a perfect means to do [technology translation and transfer] as they are short, concise and relevant." Another participant said translated technology information from the main campus should be shared with the university's other three campuses, where research also takes place.

In fact, some participants said SPARK efforts in technology translation and transfer might help reach laggards and late adopters, those who, in the technology diffusion model (Rogers, 2003) typically trail behind others in their technology uptake. One participant said "laggards are not interested, are a lost cause." But another participant pointed out laggards "are not a lost cause since they have never been targeted. They may develop interest [in technology] if exposed and engaged." One participant noted the clientele focus for SPARK is external (newspapers, etc.) and that SPARK products such as the *Research* magazine and stories in the Guelph daily newspaper

"generate discussion." Another participant said the "idea of *Research* appeals to certain groups. The format is important. Short, concise items catch some people. The format needs to fit the interests of the group," and suggested using more cartoons to draw attention to the stories.

Research question four

The fourth objective was to explore the idea of SPARK as part of a new social movement of science-literate members of society, based on two sets of questions*: When you were a SPARK student, how did you describe the experience to your friends and family? Did you see yourself as part of a bigger picture?* (question 14), and *how do you describe the movement of students and/or graduates like yourselves in society who have an accelerated appreciation and/or understanding of research?* (question 15).

One participant said they believed they were "making connections between students and society." They described the experience as "feeling mentored" and gaining confidence to engage in exceptionally challenging communication activities, such as television interviews. Another participant describes the experience as "involving technology transfer, bridging the gap between researchers and the community through communication." Another participant said "it was the only practical experience that I had at university that I left university with," while another participant described SPARK as "a start for a career in communications. The practical applications proved useful." Another participant echoed those remarks, noting prior to graduating they "used SPARK skills to improve writing for other courses."

One participant said SPARK was "definitely" contributing to a movement of students and graduates in society who have an accelerated appreciation and

understanding of research. Mainly, it is doing so through high-level skill development: not just learning to write about research, but how to write, speak and act in such a way as to influence others. One participant said SPARK "helped deal with association members in communicating a clear vision and how I could execute project management and use organizational skills." Another participant noted SPARK "provided transferable skills, for example teaching skills based on communication skills which helped in the expertise of teaching." SPARK "gave us a lot of practical work experience to show potential employers," said one participant. Another said SPARK "helped in knowing how to market oneself, how to use communication skills and helped in scholarship applications. It gave me an edge over others. The skills I learned are skills that I use every day."

<div align="center">**Responses from SPARK stakeholders**</div>

Research objective one

The first objective was to describe stakeholders' impressions of the SPARK program including their interaction with it (questions 1, 2 and 5) and the skills stakeholders thought the participants acquired (question 3).

Stakeholders' perceptions of SPARK were positive, and similar to the SPARK participants' perceptions of themselves and their roles. One stakeholder said SPARK "results in excellence in writing about science, a rare talent." Another called it "a student writing program to produce the next generation of writers." One paid homage to the program's longevity, saying "its impact is being felt twenty years later." Another stakeholder who attended the University of Guelph said he was "jealous and envious" because his girlfriend had been a SPARK writer, but he had not.

One stakeholder was impressed with SPARK participants' social and interpersonal skills, such as their "ability to schmooze and talk about their experiences," said one, as well as their ability to handle stress and work in a professional manner. "It was at a fund raiser where I saw the social networking aspect and to meet this next generation of communicators," said another stakeholder. Another stakeholder remembered "how the SPARK writers could approach groups and then prepare features and serve as a resource for staff."

Other stakeholders were impressed with SPARK products, especially the *Research* magazine. "It was seeing and receiving the *Research* magazines, the quality was really impressive. The energy that went into the magazines helped to sell ads for the magazines as a result of the quality," said one stakeholder. One stakeholder also mentioned SPARK's ability to go beyond print media, specifically mentioning video.

Several stakeholders were attuned to SPARK's role in knowledge translation and transfer. One stakeholder called SPARK "a program where students are involved in research dissemination," while another similarly said SPARK "involves the movement of knowledge and research information." Another stakeholder said it "provides more eyes in support of technology transfer," while another said "technology transfer attracts A-1 students…there were no poor [quality] students." Other stakeholders said SPARK blended or touched on various fields, including journalism and communications, public relations and research knowledge, agricultural research and business, and business training.

Some misconceptions about SPARK lingered among stakeholders. One described SPARK as "a critical experience in journalism training," even though it is a

communications program, rather than a journalism program. Another said it is a "paid internship in journalism and communications," although it is not promoted as an internship. Another called it "slave labour," even though the students are paid more than minimum wage for their work, and are not asked to work more than 20 hours a week.

Specific, tangible skills the stakeholders said were acquired by SPARK participants included excellent writing and journalism skills, professionalism, awareness, depth, confidence, openness, communication presence, organizational skills, self starting skills and time management skills. "They learn how to tell a good story on complicated topics," said one stakeholder. "They learn how to present an accessible format and have the skills to deliver," said another stakeholder. They are also versed in "translating the tech talk using the right words," said one stakeholder, and they have "the respect for sound science," said another.

Like the SPARK participants, stakeholders were convinced SPARK has been successful. One stakeholder said "it is realistic and excellent for journalism training. It is the most effective such program in North America." Another stakeholder spoke to the societal value of SPARK, saying it "needs to communicate the value of research to the public; they need to see how it impacts on [the public's] lives." Another stakeholder noted that support for SPARK, and research communications in general, is too small. "There seems to be a lack of champions in science to support such a program," the stakeholder said. "Research granting agencies need to subsidize such SPARK type programs. It needs people to promote and support the idea of technology transfer." Another said the program "needs money and support. The success of the program at Guelph has not been great outside Guelph. It has not been replicated." Another

stakeholder recalled the program in its infancy twenty years ago had initial institutional support from an administrator who at the time "stressed the need to get trained research communicators into the outside community. It has always been a shoestring operation and it definitely needs core support."

The second objective was to find what the focus group stakeholder participants believe are the strengths, weaknesses, successes and limitations of SPARK (question 6), whether students should be paid (question 5), and the program's potential for replication elsewhere (questions 8 and 9).

Here, two stakeholders mentioned those interested in starting their own SPARK program need a strong advocate." Said one stakeholder: "They need a champion or two, one for content and one for institutional support." Another stakeholder said SPARK "needs to be operated from a centralized perspective; it needs institution-wide recognition under the guidance of a champion. The champion needs to know the internal politics of the institution." Speaking to the need for financial support for the program, another stakeholder said prospective program organizers "need a corporate base to be successful." Two more stakeholders underlined that the program needs to be promoted properly to administration. "They need to understand the potential high level of impact," said one stakeholder. Another stakeholder said "they need to know what it can do for awareness of University research; that it is a useful product and that it is deadline driven."

Stakeholders supported SPARK being introduced elsewhere. "The model is here (at Guelph), it works here and maybe could be expanded to other locations," said one stakeholder. Another stakeholder said "it is needed for all research since accountability is so important today." However, others said it will only succeed if the institutional will is

present, along with certain other conditions. "It needs a research base to deliver the message," said one stakeholder. Another said "it could be transferred, but the university needs to believe in it." Financially, one stakeholder said that to succeed elsewhere, a SPARK program such as Guelph's "needs a supportive environment including financial support of $100,000 a year." Another stakeholder said "a legitimate, concise format is needed to be made available to create funding opportunities." One stakeholder thought perhaps SPARK programs elsewhere could be administered centrally: "The idea can be proposed to other locations and it is up to other institutions to decide whether or not they want to start it. The structure is already at Guelph; maybe Guelph should manage it in other locations." And finally, one stakeholder said the program "should be transferable beyond agricultural research."

The issue of transferability arose again in discussions of strengths and weaknesses. One stakeholder reiterated the scope (i.e., agriculture) was a weakness; another said covering only research was a weakness. Some stakeholders said the fact that it is not a journalism program is a weakness. "Writers need the freedom to write, they need to be encouraged with more freedom," said one stakeholder. Another stakeholder said SPARK "needs to interact more with the journalism field."

Other weaknesses raised by the stakeholders related to the program's growth. "It has almost outgrown what they were set up to do," said one stakeholder. Another said "it is hard to describe what SPARK is. There is a hierarchy in university involvement of various programs," adding that SPARK does not easily fit into a conventional model. One stakeholder said the program "has evolved and now needs to explore where it should sit vis-à-vis university structures." Another stakeholder said SPARK "needs more public

relations so that people will know what they do," but another stakeholder said a low profile is important internally "so [SPARK] doesn't get caught in internal power struggles." Others weaknesses mentioned included limited champions and no base budget.

However, some elements of the perceived weaknesses were seen as strengths by the stakeholders. For example, they cited the "champion's commitment" as a strength, and one stakeholder said the program was "cost effective; excellent benefit for the cost." Other strengths cited were consistent quality, quality of students, SPARK product uptake by administration and the media, SPARK's role in information dissemination, the way industry has supported SPARK, and the "apprenticeship" approach, which is likely a misnomer for the stakeholder's perception of SPARK's training approach.

Eight of the stakeholders spoke in favour of paying the students. "It is a really good idea that they are paid for their work," said one stakeholder. Another stakeholder said "the value of being paid is very important. It is professional pay for professional work." Pay, said another stakeholder, "adds credibility to the program. There is a need to recognize the work." Another stakeholder said pay keeps the students participating, and "participation helps in building a portfolio of experience for future employment." "Pay results in respect for work and the ability to get things published," said another stakeholder, while another said "pay levels could be based on the level of work to show the value in productive work."

Research objective two

Based on their experiences, stakeholders were asked to draw a SPARK model during the focus group session (question 7). Each participant was given a blank piece of

paper and a marker and asked to work independently for approximately 10 minutes.

Specifically, they were asked to graphically show who is involved in SPARK, and who is

impacted by SPARK. Their models were as follows:

Figure 14. SPARK model by research subject.
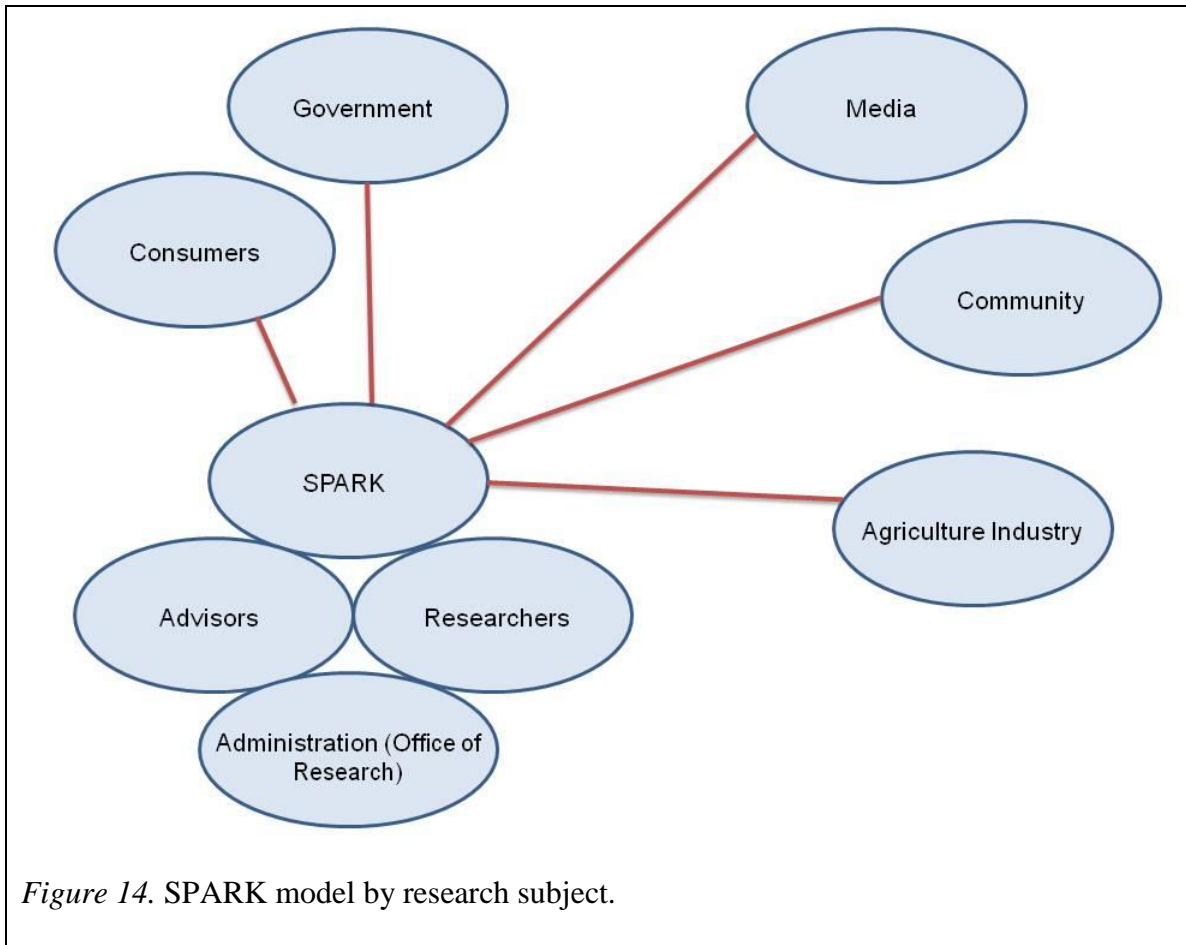
SPARK diagram (Figure 14) is distinguished by a four-part nucleus comprising

SPARK, SPARK advisors (the director, the coordinator and the marketing manager),

researchers and Office of Research administration. The short-distance connection to

consumers may be intentional to show SPARK is independently able to connect

externally. Others it connects with include government, media, community and the

agriculture industry.
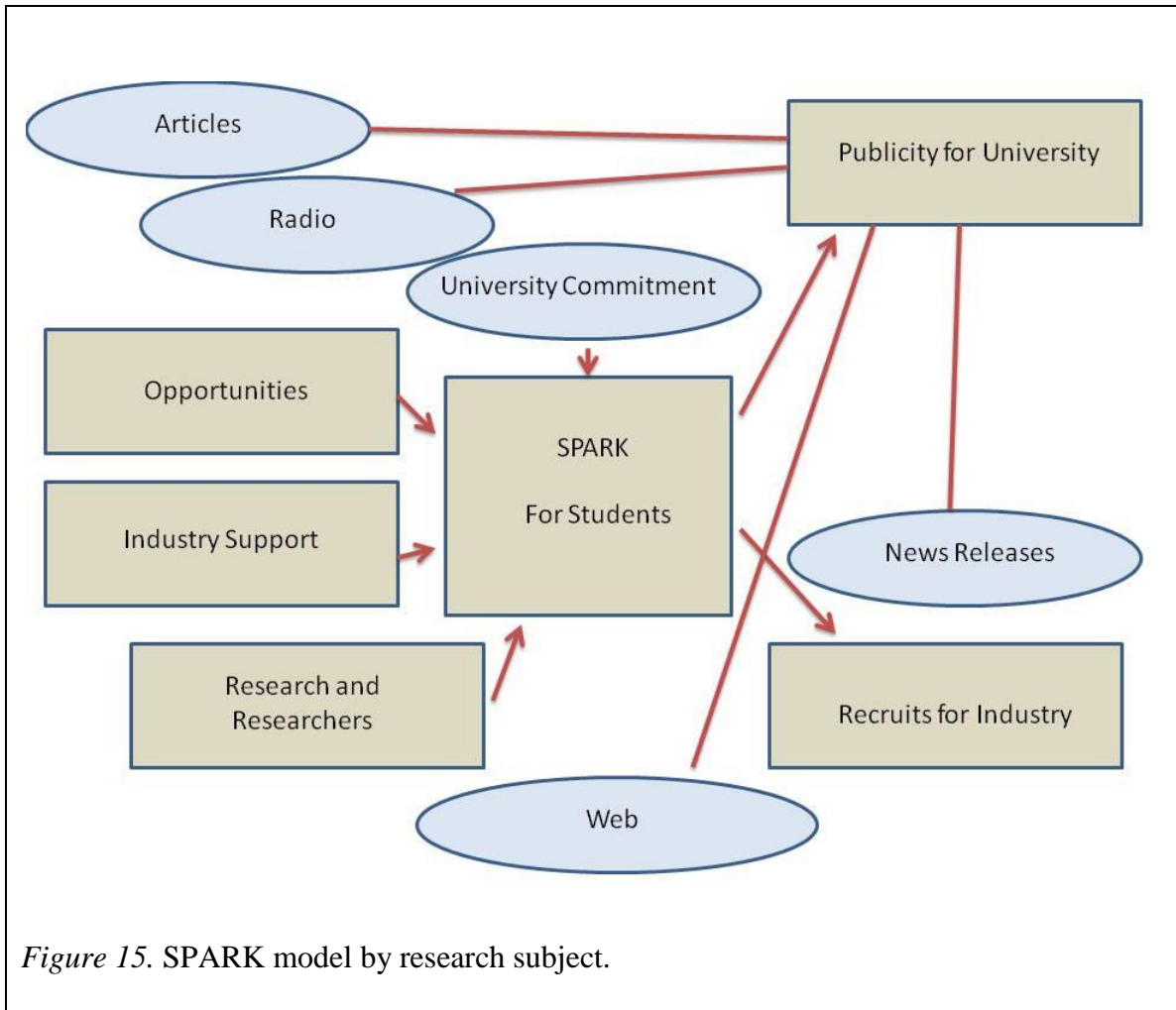
Figure 15. SPARK model by research subject.

SPARK is at the center of this diagram (Figure 15) which shows input and influence from research and researchers, industry support and opportunites to engage in projects. This diagram also shows the influence of institutional commitment on the program and how, in turn, SPARK provides profile and publicity for the institution through print an electronic media. In another reciprocal turn, SPARK is shown providing recruits for communication jobs in industry, perhaps as a result of industy support for the program.
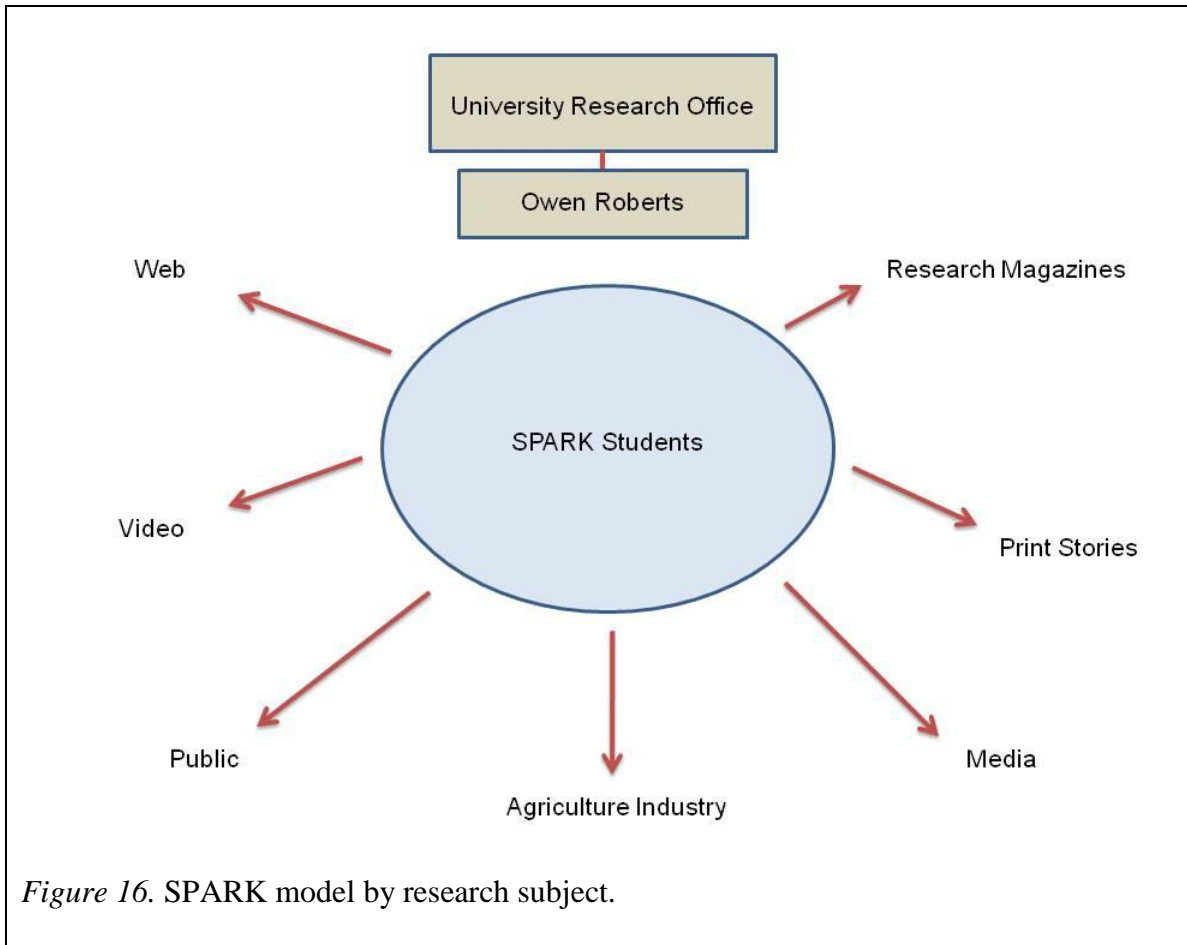
Figure 16. SPARK model by research subject.

In this SPARK-centric diagram (Figure 16), hierarchy appears to place the research office and the director (*Owen Roberts*) above SPARK, without showing connectivity to the SPARK enterprise. SPARK is highly active in this diagram, transferring knowledge via the web, by video, through print stories, on the web and through the *Research* magazine, to the media, the public and the agriculture industry.
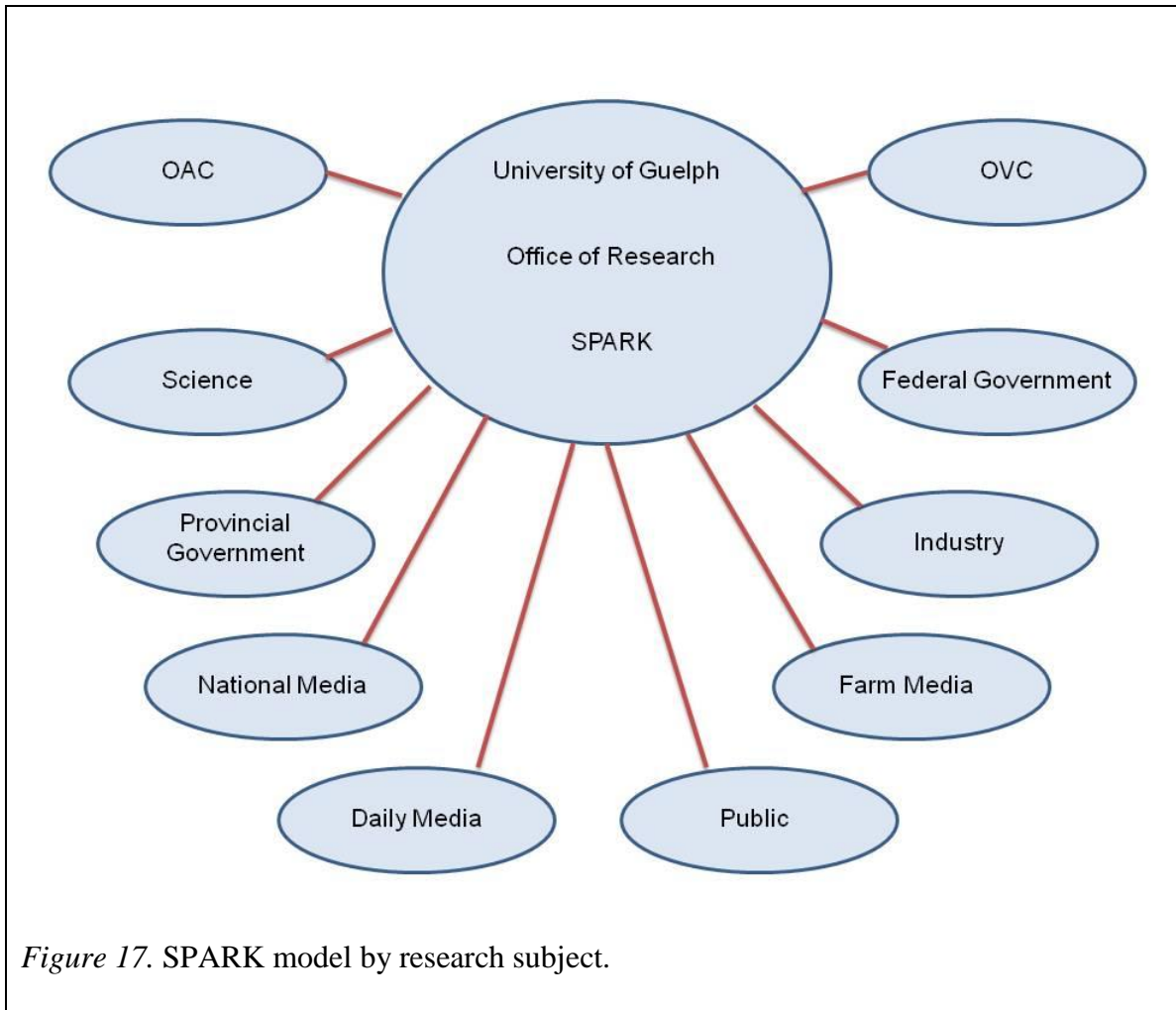
Figure 17. SPARK model by research subject.

Within a centralized sphere (Figure 17), SPARK comes together with the Office

of Research where it is housed and administered, and in the University of Guelph, which

gives it the freedom to exist. It is connected to an assortment of stakeholders and

supporters: the Ontario Agricultural College and the Ontario Veterinary College, the

science community, the federal and provincial governments, national, daily and farm

media, industry and the public.
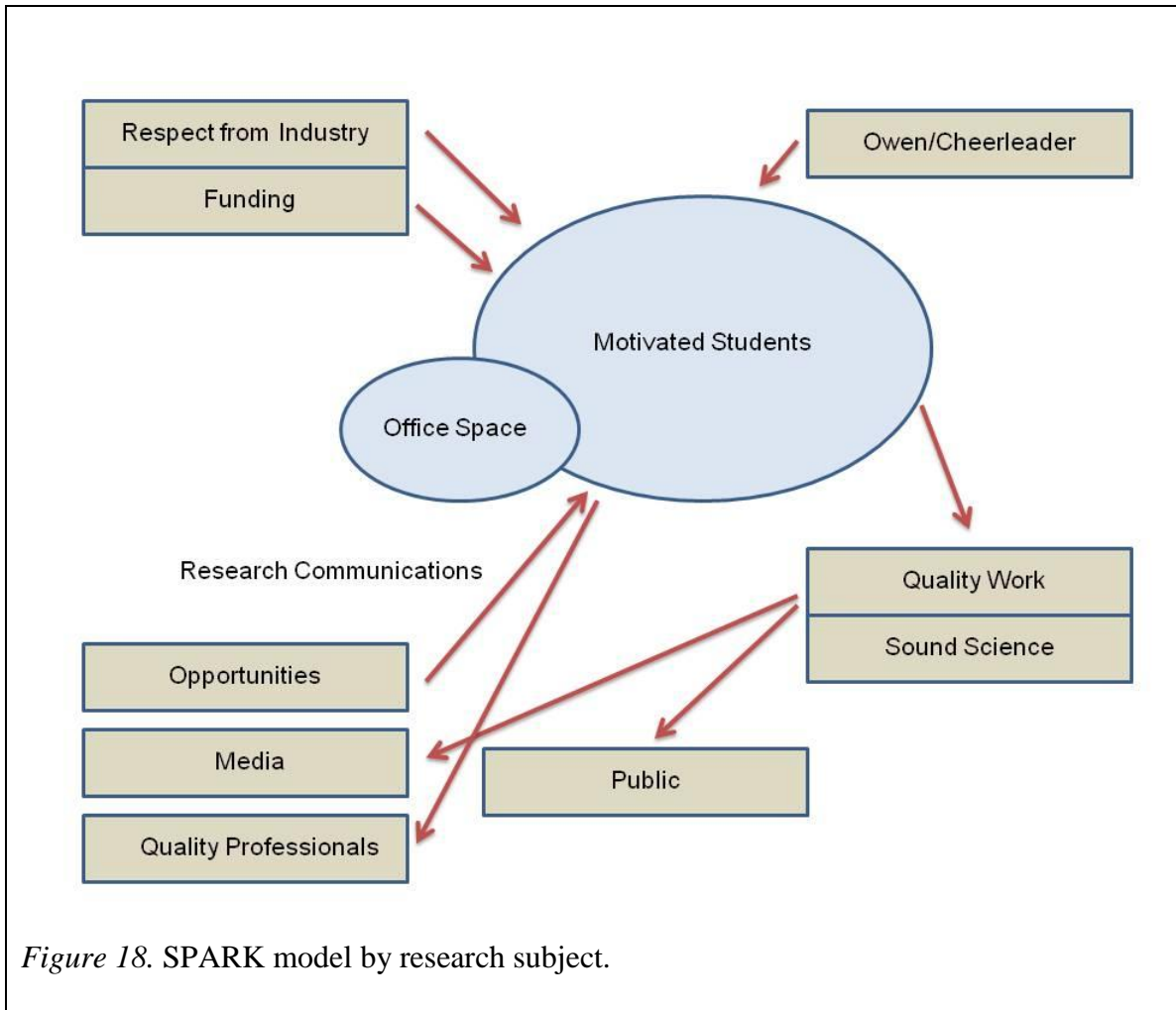
Figure 18. SPARK model by research subject.

SPARK is represented by *motivated students* in Figure 18 who are brought

together centrally in office space in the Office of Research. The research

communications unit brokers contact between SPARK, opportunities for students and the

media. The students are influenced by the director (*Owen/cheerleader*) and supported by

industry, from whom they have garnered respect. Their efforts produce quality work

based on sound science, which is transferred separately to the media and to the public

(the media is not used as a conduit to the public). Ultimately, the SPARK experience

produces quality professionals.

Figure 19. SPARK model by research subject.
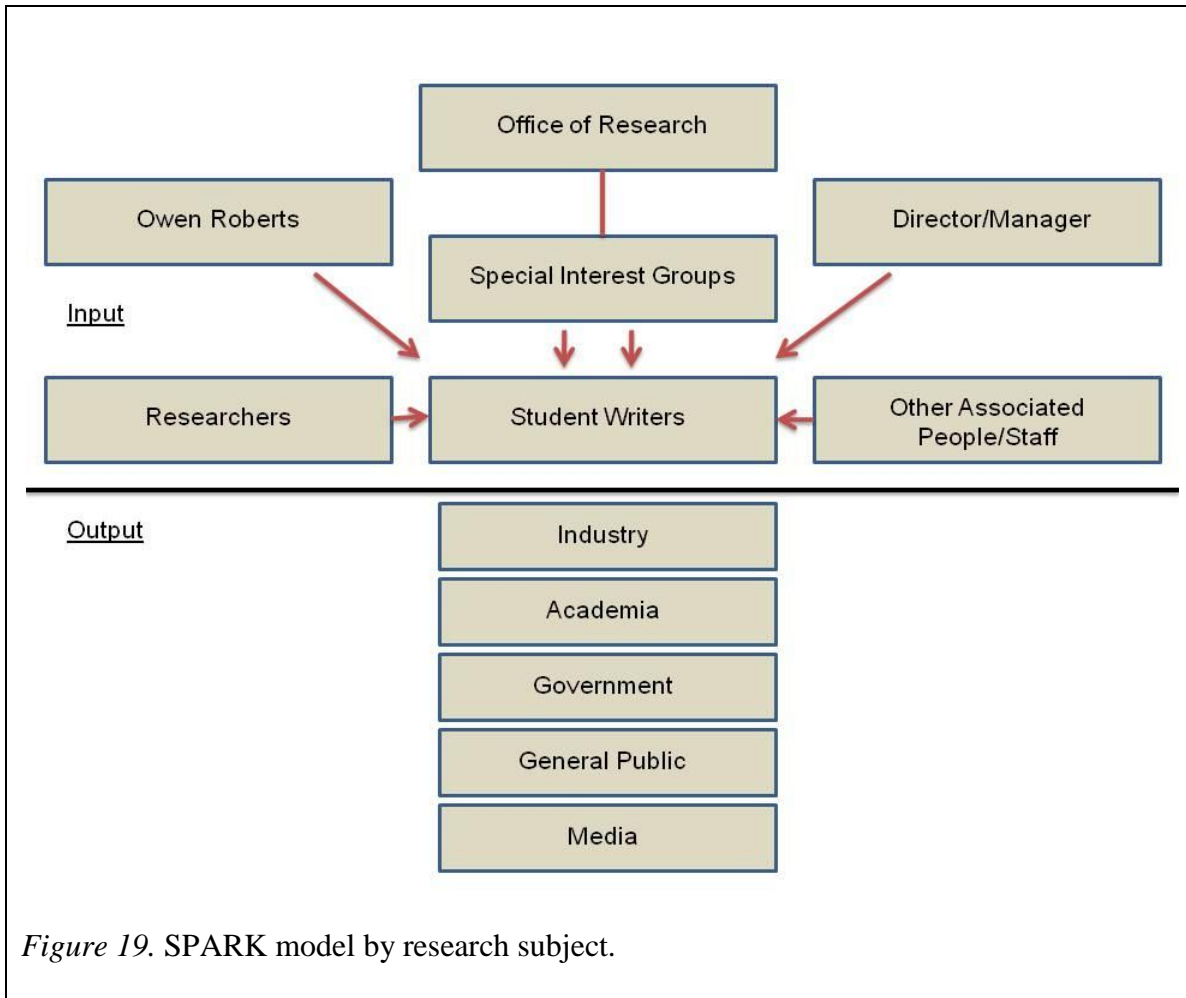
Significant direct influences on SPARK (*student writers*) appear in this model (Figure 19), including those from special interest groups (external organizations for which SPARK conducts contract communications), researchers, staff such as the SPARK coordinator and the research communications unit director (*Owen Roberts*). Five destinations appear under output: Industry, academic, government, general public and media. The dark line halfway through the diagram separates internal and external activities.
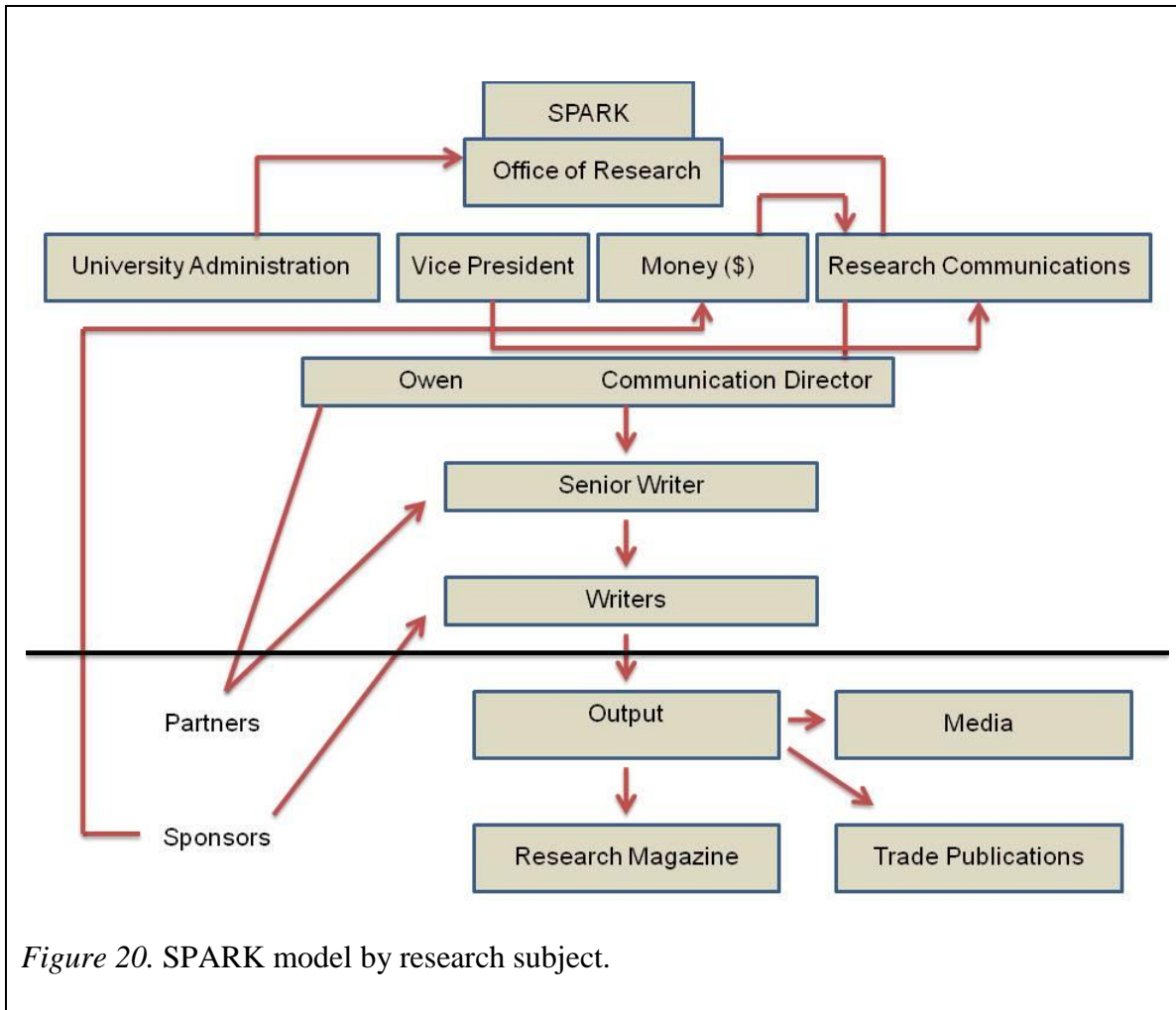
Figure 20. SPARK model by research subject.

In Figure 20, SPARK is clearly connected to the Office of Research, although

participants (*writers*) appear in the middle of the diagram as well. Research

communications receives financial support from sponsors to pay SPARK participants,

and adminitrative support from the vice-president of research for the program. The

communications director liaises with partners (who are not necessarily sponsors) to

geenrate SPARK projects. A critical path develops from the communication director to

the coordinator (*senior writer*) with output being information transferred to or appearing

in, the media, trade publications and the university's *Research* magazine. The dark line

two-thirds of the way though the diagram separates internal and external activities.

Figure 21. SPARK model by research subject.

Connectivity occurs in Figure 21 on several levels: Between SPARK participants and researchers; between SPARK and the agri-food sector, and between the SPARK program director (*champion*) who is responsible for quality control of SPARK output. Ultimately this output appears as news releases, magazines and story tips for the media (*media relations*).
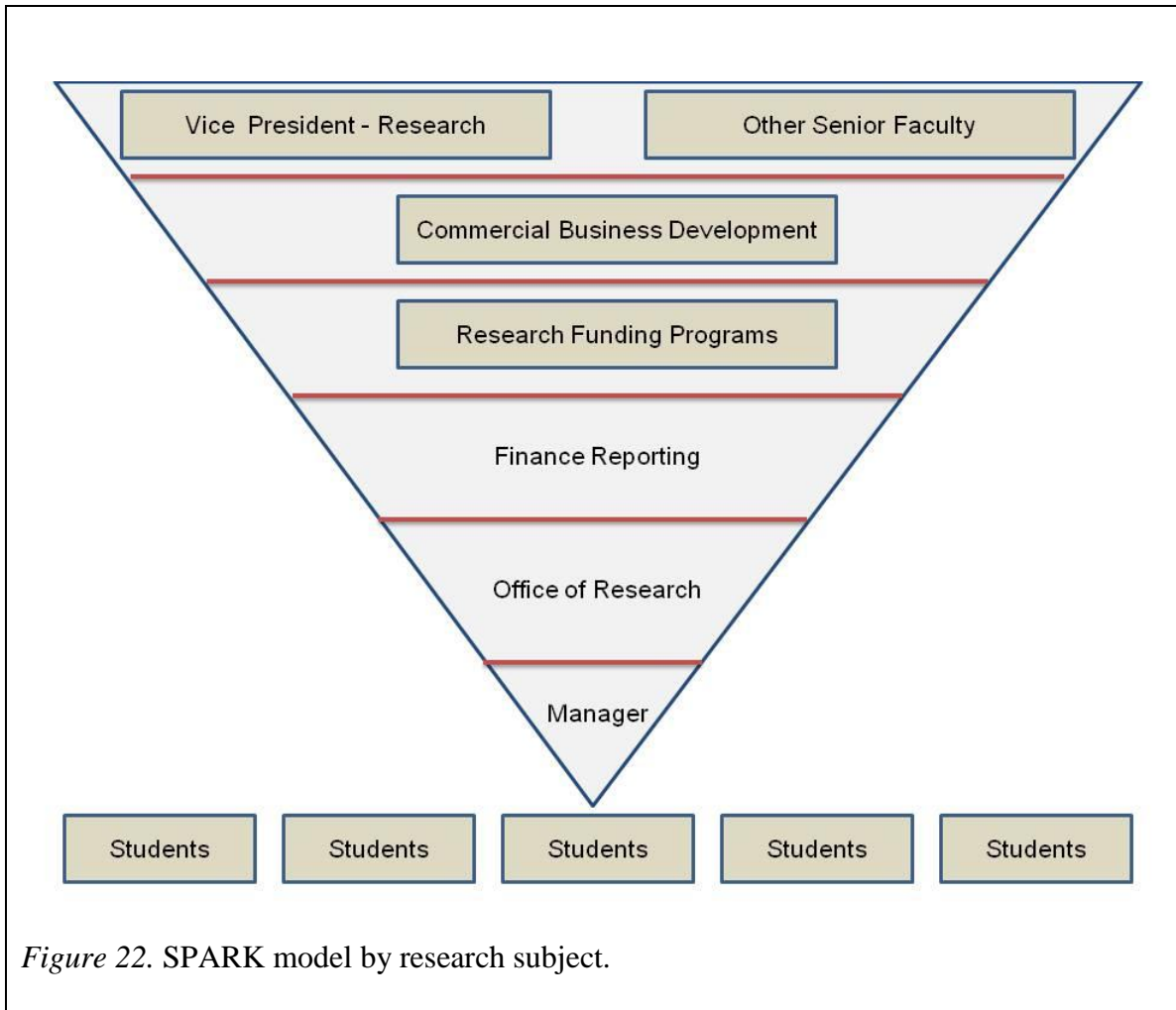
Figure 22. SPARK model by research subject.

Participants within the inverted pyramid in Figure 22 comprise those with a

relationship to SPARK (*students*) and an influence on its operation. The cascade begins

with the vice-presidehnt of research and other senior faculty who dedicate resources such

as time, space and budget to SPARK. It then moves to commercial business development

and research funding programs which both supply SPARK with story leads. Finance

reporting follows, which manages financial infrasture for SPARK, and finally the

SPARK program's locale (*Office of Research*) and direct supervisor (*manager*).
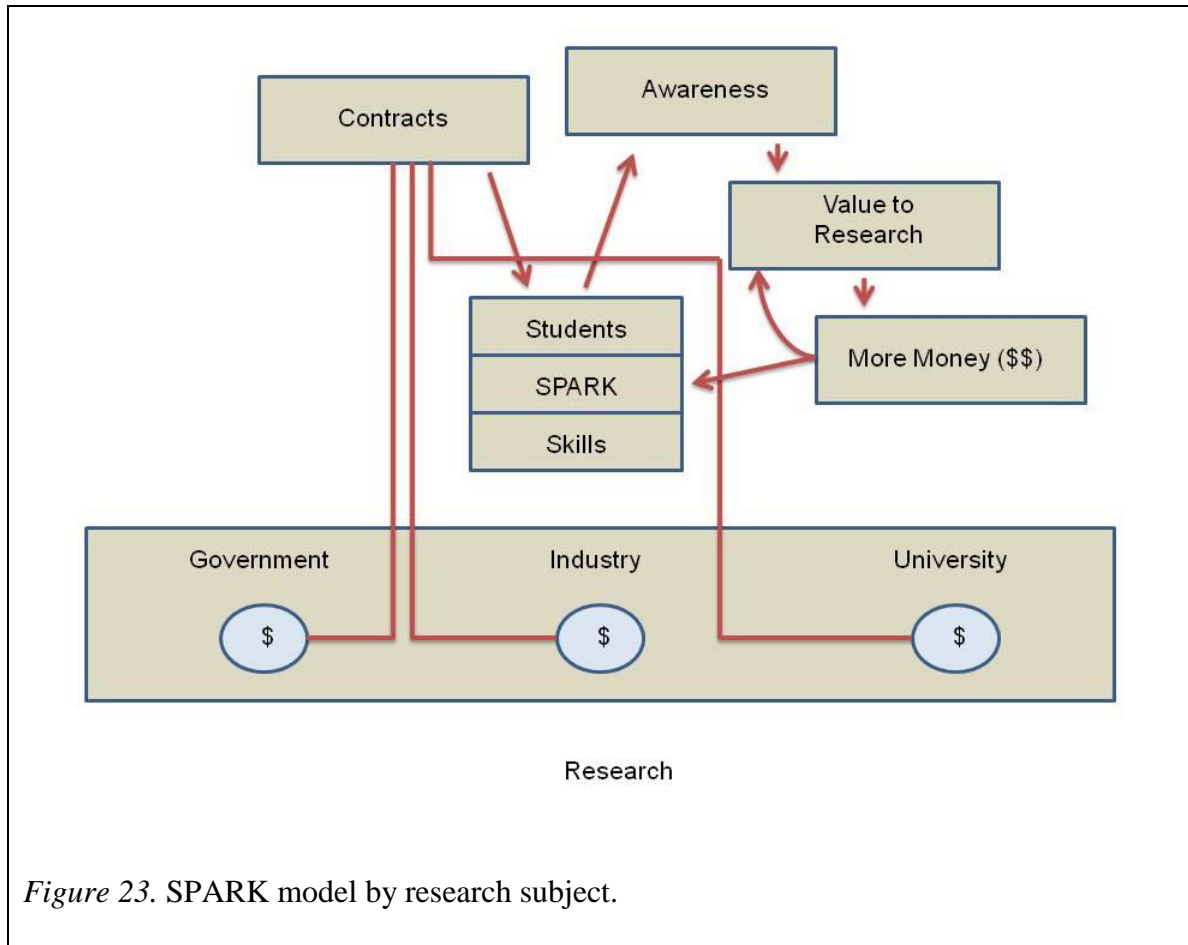
Figure 23. SPARK model by research subject.

SPARK's financial support dominates Figure 23. Government, industry and the university all contribute financially to pay for SPARK activities, through contracts and agreements. With this support, SPARK students develop communication skills used to produce material that is mobilzed for knowledge transfer. Through this transfer, awareness of the value of research to society and other stakeholders is raised, resulting in an environment that is condusive to more financial support for researchers, and for SPARK.

Research objective three

The third objective was to evaluate SPARK's current and potential role in knowledge translation and transfer (questions 12, 13 and 14), examine whether it was

indeed a role for students, or professionals, and where in the innovation diffusion process SPARK should concentrate its knowledge translation and transfer efforts.

Stakeholders did not really support SPARK and professional journalists sharing center stage. One stakeholder cautioned that "there may be some criticism and indifference from professional journalists," because students are cast into the role of doing the job of professional journalists. Another stakeholder suggested SPARK emphasize different applications from what professional journalists do," while another suggested SPARK "emphasize the quality of its [own] product." Only one stakeholder really embraced this matter, saying "SPARK's role focuses on a results-oriented product and shows the value that can be obtained from technology transfer." Another stakeholder said SPARK is effective "because it seems to bypass the bureaucracy."

Stakeholders said SPARK could branch out in a number of ways to aid the knowledge translation and transfer process. One said SPARK could get involved in television shows (which it was in the process of doing at the time of the focus group). Another stakeholder suggested SPARK alumni [*sic*] be included on twitter, which is more a part of SPARK culture than formal knowledge transfer. One stakeholder said SPARK "could be broader than just Ontario," while another said it "could be more of a bridge between research and the public." One suggested there be more tenacity in the program's due diligence. "It could be more evaluated, and stress high-value articles," according to the stakeholder. Another took a different approach, suggesting an emphasis on knowledge transfer "could improve the linkage between SPARK and the industry."

Research objective four

The fourth objective was to explore the idea of SPARK as part of a new social movement of science-literate members of society, based on the stakeholders' perception of SPARK's cultural influence (question 10), and how stakeholders' described the movement of students and/or graduates in society who have an accelerated appreciation and/or understanding of research (question 11).

Some stakeholders understood how a SPARK "culture" had evolved. "It has a strong alumni of 'SPARKERS'," said one stakeholder. "SPARK cultivates people skills, connections, networking especially through attending conferences," said another stakeholder. Another stakeholder called SPARK "a messenger for life," suggesting SPARK participants continue to speak positively about research long after graduation. "It seems to be very social with pub visits and connects to mainstream journalism, which is very social," said another stakeholder. Another said the culture would be promoted further if SPARK participation was a hiring criterion. "[There's a] need to spread the word to hire a SPARK graduate," said the stakeholder. Another stakeholder said it is possible for SPARK to play more of a cultural role through social media. SPARK "gets people involved and could get more people involved in the [research communications] process through feedback systems," said one stakeholder. Another stakeholder said it was important to have students writing at the "student level," because it communicated to the public better than scientists.

This question catalyzed a discussion about science and research reporting in general. "The problem is that the general public still doesn't really realize the importance

of research and that there isn't only one answer. It is still important to get the information out despite alternative philosophies," said one stakeholder.

Others were concerned about perceived threats to SPARK's longevity. For example, one stakeholder asked what happens when the current administrator retires. "What about succession planning at SPARK? A succession plan for SPARK is critical now that it is twenty years old," said one administrator. "What happens when [the administrator] retires? Who will be the next champion? It needs someone with a background in SPARK. [The current administrator] plays politics well." Another stakeholder said "there needs to be an overlap between champions. The transition will be critical."

Another stakeholder wondered about financial support, which is not consistent. "[SPARK] needs strong corporate support. There could be bias and industry influence….it's a fine line between support and influence, and yes, there could be influence from stakeholders [and] advertisers…but no more than in the actual press situation." Others talked about SPARK entering other countries. "I would like to see the dollars come to Canada rather than the U.S.A.," said one stakeholder. "The funding is a major factor in setting up a new program." Another stakeholder said "SPARK is a very good investment. It costs a pittance for the value produced. It gives a high return on the dollars invested." Another stakeholder noted "the intellectual capacity is really the least cost in the program; publishing the magazines is a bigger cost."

Two stakeholders, who had also been participants, summed up SPARK's importance. "Participating in the SPARK program was the most valuable part of my university experience," one stakeholder said. The other added "there is a need for it to

communicate more about what it does and its successes. Next steps are needed…but

don't let its history be forgotten."

Chapter V

Conclusions, Implications and Recommendations

Chapter four of this dissertation focused on research results, particularly through a rich description of the research subjects' comments and diagrams. Chapter five concludes this study with the presentation of a conceptual model for students' potential role in knowledge translation and transfer in Ontario. It also addresses implications related to the findings, and makes recommendations for adopting the model.

Purpose of the study

The purpose of this study was to determine students' potential role in a knowledge translation and transfer system in Ontario, and ultimately to develop a model describing that role. The hypothesis was that students can be an intrinsic part of translating and transferring information, based on factors such as their proximity to researchers, their participation in the program Students Promoting Awareness of Research Knowledge (SPARK) and the training they receive, the significant uptake of knowledge translated and transferred through SPARK, and the connections they make with the media, industry and government.

Research questions

The study was guided by four research questions:

1. How does the SPARK program affect participants' career decisions and employers' hiring decisions?

2. What are the successes and limitations of SPARK, and its potential for replication elsewhere?

3. What is SPARK's current and potential role in knowledge translation and transfer?

4. Is SPARK part of a new social movement of science-literate members of society?

Conclusions: Research question one

Qualitative investigators are said to be less definitive and less certain about the conclusions they draw from their research, tending to view their conclusions as ideas to be shared, discussed and investigated further (Fraenkel & Wallen, 2006). That said, conclusions from this research study can be drawn to inform a model for student learning in knowledge translation and transfer in Ontario.

First, SPARK addresses the ongoing call for students and graduates who exhibit exemplary communication skills, which are regarded as among the most desired skills by employers. The Conference Board of Canada (n.d.) said people can better progress in the workplace when they can read and understand information presented in a variety of forms such as words, graphs, charts and diagrams, when they can write and speak so others pay attention, and when they can use relevant scientific, technological and mathematical knowledge and skills to explain or clarify ideas. Mullett and Tucker (2007) said industry professionals called the ideal hire in agricultural communications someone with an agricultural or farm background, strong communication skills (writing, editing, design, English, interviewing, public relations, journalism, advertising, and photography), and past work or internship experience. Progressive Dairyman (2008) said written communication abilities were the top skills desired for a well-prepared incoming university freshman. A program such as SPARK, which is heavily weighted towards

written communications, could be useful for enhancing these skills. SPARK gives

participants a measure of agricultural experience by introducing them to agricultural

research topics. It develops their communication skills in writing, editing, English,

interviewing, public relations, journalism, and photography. As well, it provides work

experience in an intern-like setting.

SPARK addresses questions raised by McIntosh White and Rutherford (2009),

who wondered whether reporters should enroll in coursework to build defined areas of

expertise; whether when considering adding employees to their reporting staffs, editors

should seek candidates with special subject matter training and structure their newsroom

routines to accommodate specialty reporters; and whether universities should offer

journalism curricula to facilitate both acquisition of basic reporting skills and registration

for electives to build subject-matter knowledge.

In response, with SPARK, it is possible to offer specialty training *outside* the

curricula, provided a mentor is available with an understanding of specialty topics, and

journalism. In Guelph's case, students can enroll in an agricultural communications

elective that introduces them to topics such as biotechnology, food safety and supply

management. In some cases, they can also take part in SPARK to further hone their

specialty writing skills by interviewing professors in agriculture-based departments such

as environmental biology and animal science. As far as the researcher knows,

newsrooms have not been structured specifically to accommodate former SPARK

participants, but communication offices have indeed begun with former SPARK

participants. The participants know what to do when they sit down at a news desk. Said

one participant: "I was given a job to do (at SPARK); I was expected to do it well. The

experience set me up with the right attitude when on my first job." Another participant

described SPARK as "a start for a career in communications. The practical applications

proved useful." Another said SPARK "helped in knowing how to market oneself, how to

use communication skills…gave me an edge over others. The skills I learned are skills

that I use every day."

Conclusions: Research question two

The findings from this study were meant to help inform the creation of a model

for student learning in knowledge translation and transfer in Ontario. Doerfert (D.

Doerfert, personal communication, April 25, 2010) says a model must be developed and

promoted, to increase the understanding of the program by stakeholders. Ultimately, it

must also be evaluated to show the importance and contribution of each factor informing

the model. Such understanding helps secure supportive program funding, which is

imperative to SPARK.

Two approaches were used to gather data for the model and bring the study to a

conclusion. The first approach was for the moderator to seek verbal answers to the

research questions, such as *What tangible, specific skills would you say you acquired at*

SPARK? and *If you were to improve SPARK – if it was your program at Guelph or*

elsewhere – what would you change? The second approach was for the moderator to ask

each of the focus group participants to "draw what SPARK looked like," to draw a

SPARK model. No attempt was made to reach consensus among the participants or the

stakeholders on this matter. Rather, they were asked to work individually on their

drawings for 10 minutes or so, then present their drawings to the other members of the

focus group, and discuss them. The narrative from that discussion, as well as the drawings themselves, contributed to the researcher's conceptual model (see Figure 24).

Visual consistency varied appreciably among the diagrams of SPARK (Figures 5-23) created by the research subjects, even though at one time all members of the SPARK participant focus group had been members of the SPARK program and shared similar experiences. For example, some of the SPARK participants depicted the program centrally, at the hub of a radiating circle, with administration, the media and industry appearing in sequential ripples (Figures 7 and 11). Others with a central focus depicted SPARK receiving (i.e. translating) information from researchers and administration, then transferring them to industry, the media and the public (Figure 5).   However, another research subject showed a trio of activities or disciplines centrally (public relations, communication and technology transfer) with SPARK evenly weighted as one of four influences, along with industry, researchers and university (Figure 12). Still others saw the SPARK model as a classic top-down hierarchy (Figure 6), with a leader giving the participants direction. Participants and stakeholders said they valued the outcome of the SPARK program, but their diagrams suggested they saw the SPARK process very differently, citing various influences on them and the program, as well as what they considered different areas of importance. Coding (Appendices N & O) provided consistency to inform the conceptual model (see Figure 24) and to achieve a degree of consensus among participants.

Conclusions: Research question three

Research question three is *What is SPARK's current and potential role in knowledge translation and transfer?* This question is addressed by the illustration

depicted as Figure 24, entitled *SPARK conceptual model*. This model visually represents

the way in which a SPARK program can function. It synthesizes models drawn manually

by the research subjects, along with their comments about SPARK's characteristics and

about what makes SPARK effective.

The research subjects said knowledge translation occurs between themselves (i.e.,

SPARK) and research administration, which they saw as both human resources (such as a

dedicated leader, described in one instance as "a teacher to help students learn writing

style and professionalism") and as a physical resource, labeled as "administrative support

for infrastructure" or "university buy-in" for necessities such as office space and

technological and financial resources. This knowledge translation leads to knowledge

transfer, provided support exists from the university's external relations department, with

which a SPARK program must closely work to coordinate and maximize outreach, and

the research community, which provides the grist for SPARK-generated knowledge.

Knowledge transfer promotes connectivity with society, communities and stakeholders –

specifically, industry, media, government, the public and academia – with feedback

returning to SPARK along with support for the program arising from industry, media and

government. Media were variously described by the research subjects as "avenues for

publication" and "willing publications."
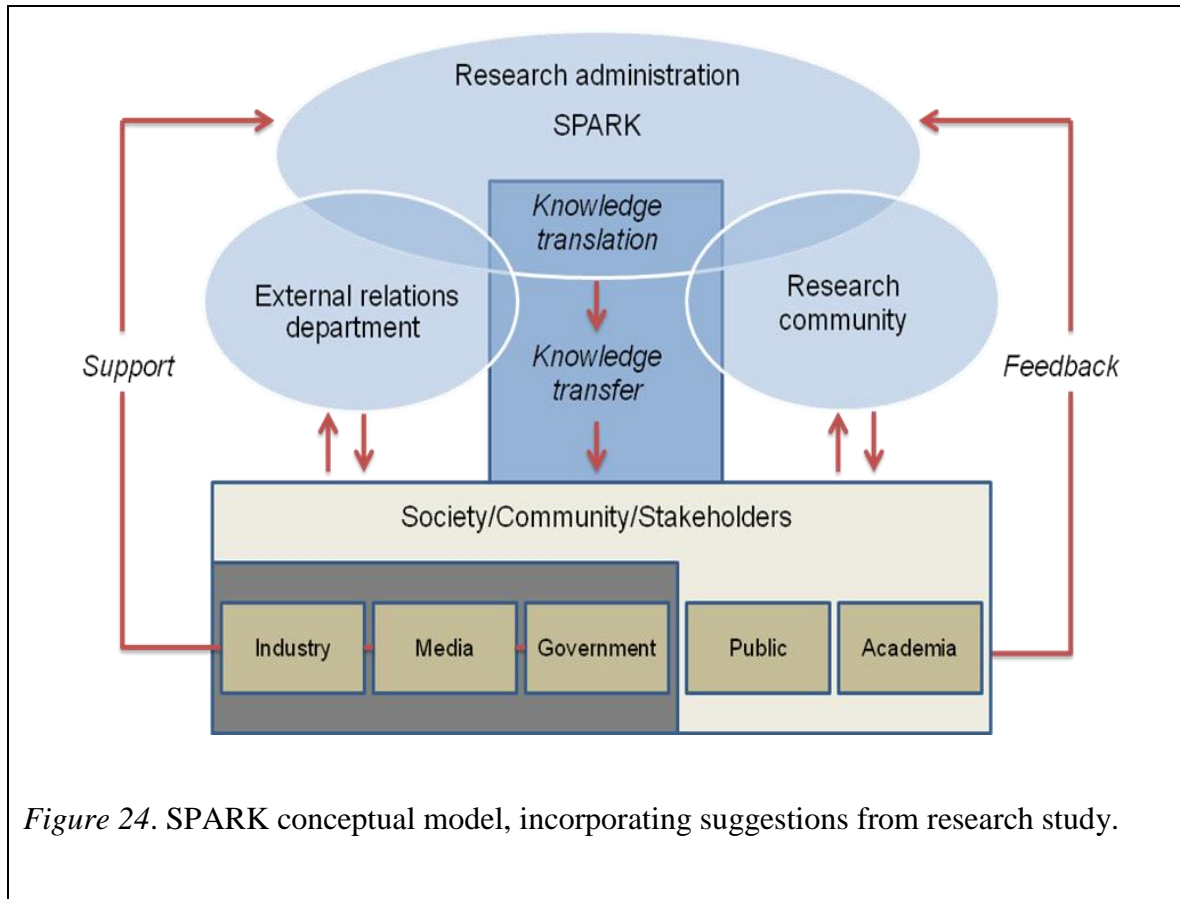
Figure 24. SPARK conceptual model, incorporating suggestions from research study.

Research administration and SPARK

In the model depicted by Figure 24, SPARK participants and research administration are inextricably linked. At the top of the model, the circle they share signifies practical and ideological commonality; practical, from the perspective that they share the same physical space (in a research office), and ideological, because they are likeminded in their mission to support the university's research enterprise through knowledge translation and transfer. The students are engaged as research communicators, receiving infrastructure support in the form of computers, telephones and office space. They liaise with research administration professionals in other units in a research office, such as grants officers who provide trust fund notifications for story leads, financial services officers who help process bills and other expenses, and business

development officers and knowledge translation and transfer officers who work with SPARK in knowledge translation.

Research community

SPARK depends on support and commitment from several sources: sponsors, administration, the students themselves and, especially, the research community. In Figure 24, information from researchers is fundamental to the knowledge translation and transfer process. Support from this community is vital for interviews, story review, photography, video and in certain cases media follow-up. Without it, SPARK does not have research knowledge to translate and transfer. Researchers work with SPARK participants to help knowledge users understand research activities and accomplishments. Communicating and disseminating the results of research to potential users and adopters is a recognized component of many existing research programs (University of Guelph, 2009).

External relations department

In Figure 24, SPARK works in conjunction with a university's external relations department (at Guelph, officially known as Communications and Public Affairs, which is the sole distribution point for mass media [but not trade media]). Promoting research success depends on "excellent linkages and coordination" (p. 20) and the continuing efforts to maintain these between Research Communications and University Communications (University of Guelph, 2010). SPARK engages in knowledge transfer through various activities, which include news story placement, news releases, video production, blogs, publication development (the university's *Research* magazine, for example) and newsletters.

Stakeholders

Broadly, the recipients of SPARK-related knowledge transfer are members of society, various communities (agriculture, health, environment, etc.) and stakeholders in knowledge transfer, such as the public, which as explained in Chapter One, has an appetite for research news. More specifically, stakeholders include the media, government and industry, each having their own motivation for receiving new knowledge and seeking it or receiving it from SPARK. Media use SPARK-generated stories either as direct placements or for story leads. Government uses SPARK stories to be informed about new research developments that could inform policy. For its part, industry uses SPARK stories to be apprised of new knowledge that could lead to greater profitability or commercialization. Others interested in receiving SPARK-generated news include academics, who see SPARK stories as an easy, accessible and immediate entry point to understand what other researchers are doing inside and outside of their discipline.

Feedback

Direct feedback is a strong feature of this model, and it has the potential to improve in both velocity and frequency with the event of social media and electronic communications. Traditional forms of feedback include letters to the editor, telephone calls and email. They continue to resonate in the farm community in Ontario, as it gets up to speed electronically. However, even though more farmers are online, their knowledge and comfort level may not yet be fully developed. Appleby (2009) said as little as five years ago, certain words now associated with the Internet were not in the average Ontario beef farmer's vocabulary, and urged farmers not to be distraught if they consider the electronic communication learning curve to be steep and the language

strange. "While you may not know what some of these words mean…don't fret. Even those of us who work in agricultural communications are running to keep up" (page 8).

Support

An important part of the SPARK conceptual model (Figure 24) is support from industry, media and government. Part of this support is ideological, supporting the concept of students being involved in knowledge translation and transfer. Equally important is support through the dedication of resources for SPARK, particularly as university budgets shrink and internal resources are increasingly challenged. SPARK participants are paid for their activity, and their comments to the focus group moderator showed they place high value on that aspect of the program, and consider it important for promoting professionalism. Industry, media and government all benefit directly from SPARK activity. As well, SPARK has been a source of trained employees in several cases. Without strong external support, SPARK has difficulty surviving, as was seen by the sustainability problems encountered by the NSERC SPARK experiment, described in Chapter One.

Conclusions: Research question four

The fourth objective was to explore the idea of SPARK as part of a new social movement of science-literate members of society. This question did not evoke strong responses from the research subjects. Some stakeholders understood how a SPARK "culture" had evolved. One participant said they believed they were "making connections between students and society." One participant said SPARK was "definitely" contributing to a movement of students and graduates in society who have an accelerated appreciation and understanding of research, mainly, through high-level skill

development: not just learning to write about research, but how to write, speak and act in such a way as to influence others. A stakeholder called SPARK "a messenger for life," suggesting SPARK participants continue to speak positively about research and science long after graduation.

Moccia (R. M. Moccia, personal communication, February 1, 2010) said SPARK mirrors the cultural shift in society, with an increasing number of people applying to university, leading presumably to a more educated society. In that light, he saw SPARK as part of a broader social movement towards a more scientifically literate society. The community of learners created through the SPARK program may be seen as part of a new social movement (NSM). It could be distinguished by members who are science savvy, given to deep learning (Gagne, 1970) and more. Through their exposure to SPARK, participants become aware of how knowledge strengthens a society (R. M. Moccia, personal communication, February 1, 2010). That understanding may inform personal and professional decisions regardless of the occupations they choose upon graduation.

NSMs are distinguished in part by learning sites, created when a self-interest group comes together to generate new knowledge and action which could result in social change (Welton, 1993). In Canada, NSMs have traditionally been associated with adult education and labour movements. However, as a more knowledge-based society develops and emerges, NSMs could be defined as people who come together as learners in an experiential learning initiative or identifiable learning environment such as SPARK, bent on influencing social policy long after their tenure with SPARK. Selman and Dampier (1991) said a popular education movement is emerging in Canada, with groups that involve themselves in decisions about how knowledge will be used. SPARK

participants are part of the decision making process about research knowledge. Through

the knowledge translation and transfer process, they are a fundamental part of deciding

not only how knowledge will be used, but rather, they help define the body of knowledge

itself that will be made available to society.

Implications: Research question one

If maintaining engagement in the learning process is indeed a continuous battle

(Murphrey, Boyd, & Felton, 2009), SPARK may be an effective weapon against student

apathy. Research subjects said SPARK affected them positively while they were

students. "Participating in the SPARK program was the most valuable part of my

university experience," said one participant. Another said SPARK "gave us a lot of

practical work experience to show potential employers." Another said SPARK "helped

in knowing how to market oneself, how to use communication skills and helped in

scholarship applications. It gave me an edge over others. The skills I learned are skills

that I use every day." The implication is that if students see a benefit in a program, they

may be more inclined to be engaged in the learning process.

Implications: Research question two

SPARK has implications for knowledge users. Moccia (R. M. Moccia, personal

communication, February 1, 2010) said SPARK appeals to what Rogers (2003) called

early adopters and the early majority (see Figure 26), and that the program's efforts

should be directed accordingly. Moccia said early adopters and the early majority are the

people who drive change in society, and who would benefit the most from SPARK's

research material (videos, publications, etc.). He said SPARK needs to inform them of

research activities and accomplishments so they can facilitate change. Supporting a

climate of change is aligned with the mission of university research, which is focused on

inventive thinking and risk taking, rather than the status quo, according to Moccia. For

that reason, he also said SPARK programs belong at universities, where participants are

encouraged to focus on research developments and the early stages of research, rather

than being bridled in scenarios where research activity is not as dynamic, and research

dissemination is approved long after the knowledge has been adopted.
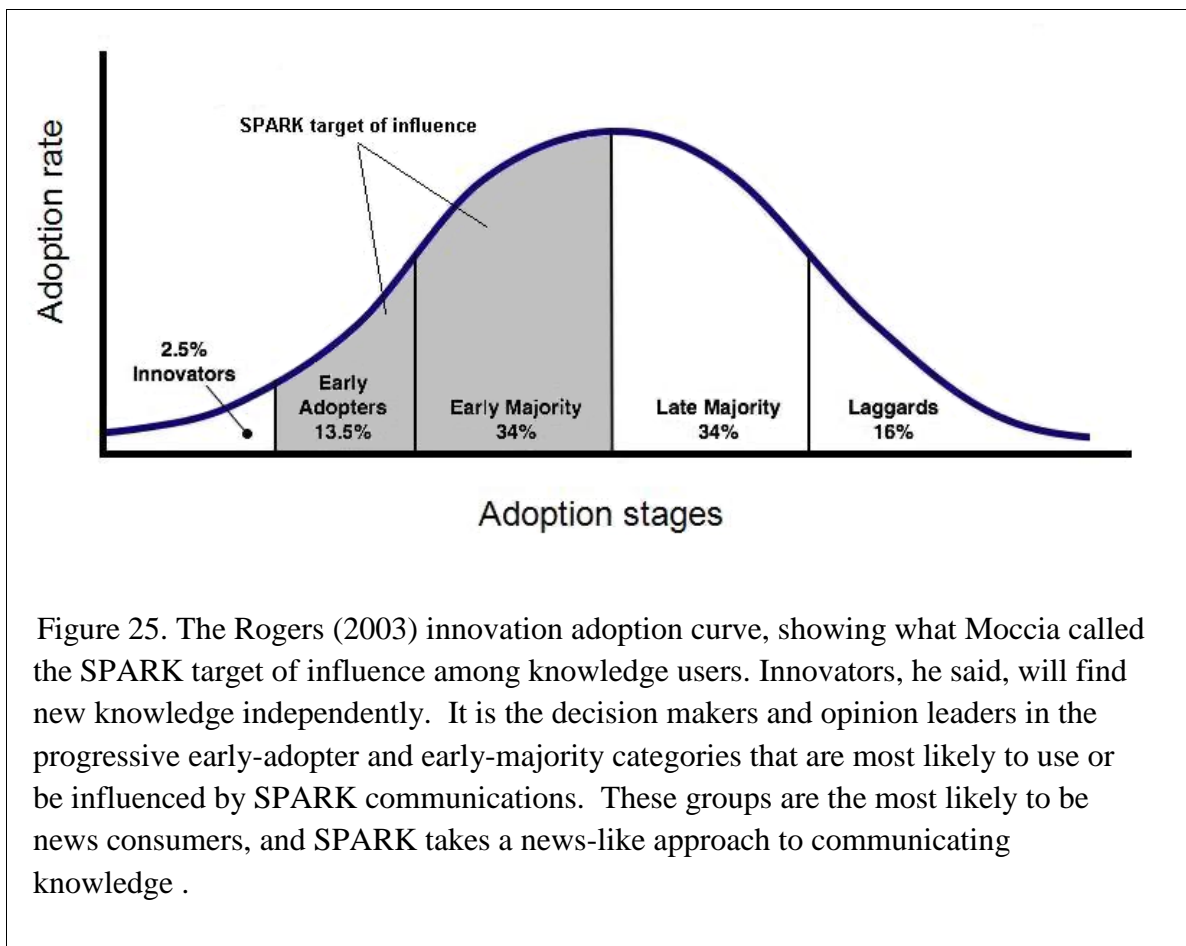
 Figure 25. The Rogers (2003) innovation adoption curve, showing what Moccia called
the SPARK target of influence among knowledge users. Innovators, he said, will find
new knowledge independently. It is the decision makers and opinion leaders in the
progressive early-adopter and early-majority categories that are most likely to use or
be influenced by SPARK communications. These groups are the most likely to be
news consumers, and SPARK takes a news-like approach to communicating
knowledge .

Implications: Research question three

Other institutions could have their own SPARK program, and efforts could be

made to introduce this model to other educational institutions, particularly those with a

strong research and extension mandate, to assist knowledge translation and transfer

efforts. One key is the availability of a strong mentor for the students. As noted in Chapter Four, research subjects in both the SPARK focus group and the stakeholder group repeatedly cited the mentor's role as being critical for the program's success. The mentor has been described in various ways: a teacher to help students learn writing style and professionalism, a trained journalist, recruiter and trainer, someone to make industry connections, head and coordinator. One research subject said the leader must have "contact at many different levels and good relationships with others." Another cited connections with "industry, funding and research" as being important. To that end, a job description (Appendix C) of the director can help others understand the pivotal role of the mentor.

Implications: Research question four

Spencer (1998) said members of new social movements (NSMs) learn together to identify the issues, to seek out the knowledge needed, and to develop a plan to bring about change. Within NSMs, learning takes place all time. The learning processes spills over into social action and ranges across multidisciplinary areas, which include developing people skills, processing information and initiating and planning social action. This may help answer questions raised by Mowen, Roberts, Wingenbach, and Harlin (2007) about where and how teachers are getting information. In their study, they asked specifically about biotechnology, and found a group of Texas agricultural science teachers had not attended any biotechnology related workshops or classes since graduating from college. Yet, they said they supported biotechnology, and they taught agriculture. Perhaps it is possible in today's information-driven society for professionals such as teachers to gain understanding in non-traditional, non-classroom-learning ways as

part of a grounded-in-science NSM, even if they do not self-identify as being affiliated

with the particular movement, or even realize they are part of it. As Mowen et al., (2007)

stated, the discrepancy between knowledge level and workshop attendance has

implications to countless agricultural education university faculty members who routinely

develop and deliver in-service workshops for agricultural science teachers in their

respective states. If that knowledge is being garnered through NSMs, either overly or

covertly, overtures should be made and bridges built. One way to reach these NSMs is

by seeking their roots, which in this case, is SPARK.

Recommendations for practice

It is recommended that SPARK be aligned with broad communications and

extension initiatives in various jurisdictions. The mood is ripe for enhanced forms of

what has traditionally been called extension (and in some cases, still is), although the

delivery mechanisms vary widely. Organizations continue to value traditional media;

despite the growing emergence of electronic media, traditional media outlets are still

considered the most trusted sources of information (Cision, 2010). Face-to-face

communication, too, is making a comeback; for example, in Alberta, provincial

agriculture department offices have been enhanced for greater walk-in service for farmers

and others, rather than phoning a centralized help desk (MacArthur, 2008). In

Saskatchewan, one of Canada's major agricultural provinces, a Ministry of Agriculture

Regional Services branch has been enacted to work directly with farmers, ranchers and

industry agrologists to ensure producers have access to the latest technical knowledge and

research results (Morrison, 2008; Finnamore, 2009). This initiative's emphasis is on

knowledge transfer through one-to-one meetings between extension personnel and

producers, rather than through websites or even telephones calls. The Saskatchewan

agriculture minister said his department "heard overwhelmingly from farmers and

ranchers that a telephone line or website is insufficient to meet their current needs,"

perhaps underlining the lack of interpersonal connectivity described as an initial deterrent

to computer-medicated communication by social presence theory (Walther, 1996). In

any event, in both the Alberta and Saskatchewan cases, a SPARK program could help

provide extension personnel with knowledge translated from researchers, as hand-outs,

brochures, presentations, etc.

In Manitoba, another of Canada's most significant agricultural provinces and

Saskatchewan's immediate neighbor to the west, a major effort is being made to move

canola producers to immediate, customized electronic information which the Canola

Council of Canada (2010) said will "revolutionize communication in agriculture"

(assuming farmers have high-speed Internet access, required for many of the respective

applications). The council said an initiative called Grow Canola 2.015 will use email,

smart phones and social media platforms to provide producers with real time agronomic

updates and will serve as a model for other agricultural sectors. And even though the

delivery mechanism is much different than the face-to-face communication desired in

Saskatchewan, content will be vital for Grow Canola 2.015's success. Farmers said the

initiative will save them time researching and addressing agronomic issues, and they are

particularly keen to use a web-based diagnostic tool to send text or photos to an expert for

immediate assistance and to be able to localize agronomic information such as variety

performance, disease control, insect forecasts and weed control. In this case, SPARK

program participants could again be helpful providing extension personnel with

knowledge translated from agricultural researchers, such as scientific advances and effective treatments.

Producers' demand for immediate responses puts a great deal of pressure on extension personnel, which could be assisted by SPARK. Having SPARK-produced material on hand as a reference, or as instructional material or information to send back to producers, could be an important part of the response from the extension agent. Reschke (2009) says farmers are taking a similar approach in Ontario, particularly with smart phones, so farmers can take a photo of disease, pests or nutrient deficiencies, email it to an agronomist or ministry of agriculture representative and have it diagnosed quickly. In that way, the SPARK program can likewise provide knowledge translated from agricultural researchers, in response to producers' requests.

And further to electronic communications, the Agri-Food Innovation eNetwork (2010) says it recognizes the need for farmers, and industry stakeholders to all embrace new technologies, and enhance the communication of these technologies towards best practices. It said virtual learning and communication are becoming more prevalent and will continue to do so in the future, becoming a critical enabler for the agriculture industry in Canada. The network's goal is to develop an innovative learning environment, an online website that will have the capacity to convert and disseminate existing research findings, such as those generated by SPARK participants, into a variety of learning formats. That will make knowledge more accessible, comprehensible and applicable for the target audiences, it said, and create a forum in which researchers, farmers, academics, producer associations, government and non-government organizations and their communities can develop an open and inclusive environment for

knowledge exchange. The network says its longer term goal is to accelerate the pace of research uptake, increase the frequency of its integration into agricultural practice and commercialization, and ultimately stimulate rural economic development.

Another recommendation is to align SPARK with new areas of emphasis in the agri-food sector. For example, in Canada, support is growing for extension in non-traditional areas of the agri-food sector that could benefit from being involved with SPARK programs. The Organic Agriculture Centre of Canada, headquartered at the Nova Scotia Agricultural College, received more than $700,000 to link organic knowledge and connect the needs of producers and values of consumers with the science of organic (Hammermeister, 2007). The centre is working with provincial extension specialists to develop resources for producers and consumers. Resources that are research based and emanating from the agricultural college could be created with assistance from SPARK program participants.

Other initiatives are underway to bring agriculture and the media closer together. The Dairy Farmers of Ontario (DFO) aim to improve milk promotion through media relations (Anderson, 2008) with a guide for urban journalists and a media team of dairy and poultry farmers who are visiting daily newspaper editorial boards to discuss issues such as Vitamin D deficiency and chocolate milk as a sports recovery drink. SPARK has an agreement to provide research news stories monthly to DFO (see Appendix J) which could likewise be used as collateral for these meetings or other farmer-media meetings.

SPARK should seek opportunities to work with those trying to make agriculture a career choice and educational experience prior to university. Agriculture is not

formally taught as a subject in classrooms like it is in some American states. But in

Ontario, Ontario Agri-Food Education (OAFE) provides learning materials for teachers

who voluntarily choose to incorporate agricultural examples and issues into lesson plans

dealing with science, etc. An eastern Ontario group (Cumming, 2008) has called for

mandatory instruction in agriculture and food production from grades one through eight.

This intention points to an interest by the agri-food sector in creating new learning

opportunities. The Canadian Agricultural Communicators of Tomorrow group on the

University of Guelph campus has been involved by OAFE to be part of an advisory

committee, and through OAFE could make students aware of SPARK, which might turn

into a recruitment opportunity for agricultural communications-oriented students for the

University of Guelph and the Ontario Agricultural College. This could particularly be the

case if some of the products of SPARK, such as the University of Guelph's *Research*

magazine, are made available to teachers through OAFE. SPARK's involvement in the

magazine is always highlighted in the contributors' section, giving students an

opportunity to see how they too can become part of the knowledge translation and

transfer continuum.

Another recommendation is that a cross-sector SPARK-like communications

coalition be considered either in Ontario, in Canada, throughout North America or

globally, through connections such as the International Federation of Agricultural

Journalists, the Association for Communications Excellence or other networks in which

the researcher is involved. Mann (2005) says during the past two decades, Ontario

agriculture has increasingly been forming coalitions around different issues, such as the

Ontario Farm Environmental Coalition, the Ontario Farm Animal Council, Agricultural

Groups Concerned About Resources and the Environment, the Innovative Farmers Association of Ontario and the Grain Farmers of Ontario. At various times, SPARK has had agreements to supply the latter four coalitions with research stories or be involved in communications projects to support their mandates. However, while communications-oriented organizations exist such as the Eastern Canada Farm Writers Federation, the Canadian Association of Science Writers, the National Agricultural Communicators of Tomorrow and the Association for Communications Excellence, there is no coalition of university students dedicated to a communicating agri-food *research*. Perhaps this void could be filled by establishing a student chapter of an existing association, so as not to dilute, but rather enhance, membership in these groups, which may stagnating or losing members. However it comes about, though, locally focused SPARK-like programs would cater to the needs of the media and accomplish the goal of heightening the understanding of agriculture. Localness is considered the most important reason journalists use printed news releases for television and newspapers (Abbot & Brassfield, 1989); the most common reasons for accepting a news release is its timeliness, human interest and proximity or localness. While SPARK stories are not actually positioned at the University of Guelph as news releases because they are written as news stories (for placement in commodity publications and elsewhere), it is common for the university's communications and public affairs department to modify them slightly and turn them into news releases.

A SPARK coalition would contribute to universities' drive to make themselves relevant by engaging the world more fully. SPARK provides a service to the public by translating and transferring knowledge to users, while simultaneously providing

participants with a unique educational and communications experience. Globally, Neelameghan and Chester (2006) say rural and marginalized communities in developing and in developed countries' information needs are not adequately met, and consequently they have not been able to productively participate in the development process, or enjoy its benefits. Clarke (2006) said farmers in Europe and North America tend to obtain information about new research from the agricultural press, or increasingly, from representatives of companies promoting new products, because there is little opportunity for direct communications between farmers and researchers. Clearly, there is room for new knowledge translation and transfer approaches, such as SPARK, to help address such disparities.

A most promising opportunity for agriculture to establish itself as health-oriented discipline and reap the benefits of such connectivity (e.g., for agriculture researchers and farm groups to have access to health research resources) and help address important societal issues such as obesity may be through a SPARK health-research coalition. This is already underway as a prototype at the University of Guelph, through a new credit course program involving SPARK and the Human Health and Nutritional Science (HHNS) department, called HHNS-SPARK. In this program, an HHNS faculty member and the SPARK director (the researcher) work with five HHNS Master's students on four assignments: interviewing faculty and writing two mainstream-media news stories used SPARK resources (such as the SPARK news writing guide), writing one journalistic critique (reviewed mainly for style, structure and content) of a mainstream media news story about health and nutrition, and writing one scientific critique of a mainstream media news story about health and nutrition. The importance of this topic in agriculture is

underlined by the National Agricultural Biotechnology Council (2010), which chose as

its 2010 conference theme Promoting Health by Linking Agriculture, Food and Nutrition.

The council noted that with health care consuming so much of the developed world's

resources, it is critical to understand how diet, nutrition, and the underlying agricultural

production systems impact human health, and to address the science linking agriculture,

food and nutrition with the goal of informing research priorities and government policies

that seek to improve human livelihood.

Guelph's SPARK program has never operated with an advisory council, but it and

any other potential SPARK program should consider doing so. The broad reach of the

program and its numerous influences and requirements (e.g., financial support) would be

aided by a wide-ranging council consisting of representatives from the stakeholder

groups). Gamon (1987) called advisory councils "real friends" and suggested they be

distinguished by fun, sociability and informal contacts, and not just be about work.

Students can be fun, and asking one of two of them to likewise serve on a SPARK

advisory council would help introduce Gamon's desired elements.

Recommendations for research

Moccia (R. M. Moccia, personal communication, February 1, 2010) said SPARK

appeals to early adopters and the early majority (see Figure 25), and that research

material from SPARK should be communicated to them. To that end, studies should be

done in Ontario to determine what media leading farmers prefer. This study could be

done through a survey at a gathering of farmers such as the Innovative Farmers

Association of Ontario annual conference, which draws up to 300 Ontario farmers

committed to innovation. The researcher supervises a special topics class for third and

fourth year Ontario Agricultural College students which in 2010, for the first time, featured an exit survey of participants. Next year, added to this survey could be questions about how farmers' preferred media.

A SPARK program also addresses research questions raised by McIntosh White and Rutherford (2009) about whether universities should offer journalism curricula to facilitate both acquisition of basic reporting skills and registration for electives to build subject matter knowledge. Although the University of Guelph does not offer a journalism program, SPARK is purposefully (but not exclusively) populated with students who are enrolled in, likely to enroll in or have graduated from third- and fourth-year agricultural communications electives, taught by the researcher. In this way, SPARK helps students build expertise in communicating about agriculture, given most of Guelph research is agriculture based. A handful of SPARK students will go on to careers as agricultural journalists in Canada, but many more will be involved in dealing with journalists, agricultural and otherwise, in roles such as communications professionals and commodity group leaders. They are using both their command of basic reporting skills to understand journalists' needs, and their exposure to agriculture to better explain issues important to the media and the public.

Further research could include a follow-up study that re-gathers the focus groups, so the participants could review their models (Figures 5-23) along with the conceptual model (Figure 24), to determine if they accept it as a reflection of their common vision, or whether they have other suggestions. Or rather than re-gathering the participants, SPARK could be introduced to a new potential community of participants, perhaps through research and communication efforts led by the proposed endowed research chair

in agricultural communications at the University of Illinois (Schilling, 2009), in the name of Dr. James F. Evans.

Finally, further research could be conducted as part of the new knowledge translation and transfer thrust at the University of Guelph, to understand the uptake of knowledge by users receiving SPARK-generated information, and its impact on society. Van Beek (1997) says in agricultural knowledge systems, efforts to understand adoption rates (and in particular, poor adoption rates) is lacking, and that extension requires "a greater understanding of rural communities and individuals, their knowledge, attitudes, skills and aspirations. The challenge is to scratch below the surface and deal with the real issues which prompt people to change" (page 183). Indeed, SPARK's greatest asset may be helping prompt societal change, through knowledge translation and transfer.

Observations

This dissertation was designed to create a model for student learning in knowledge translation and transfer (KTT) in Ontario. Following the model could help other institutions create their own structure for involving students in a KTT program or a research communications initiative. This structure should be possible to create not just in Ontario or Canada, but wherever KTT is part of an educational setting.

A methodic, strategic approach to the model's design will help its proponents institute the required infrastructure in a sensible, orderly manner. The strategic approach to creating a KTT program should start with a major emphasis on garnering support from administration. Such support was repeatedly identified by the research subjects as being critical for the program's success.

Senior administrators can be among the greatest champions for the program, internally and externally. Internally, they can speak to faculty about its virtues, and ensure the necessary administrative help (such as financial and human-resource administration) is available to spirit the program along.

Externally, senior administrators can likewise promote the program as a unique and wholesome approach to introducing students to research, and to translating and transferring knowledge-generating activities (such as research) to stakeholders and users. Communication products of such a program (news stories, magazines, web sites, videos, blogs, etc.) have broad benefits to the university and can be used extensively by senior administrators to promote the institution and its knowledge capacity.

Through my twenty years of experience in creating and developing the student-driven KTT program SPARK, and through data generated by the instrument in this study, I have found a successful approach to this initiative entails being identifiable, visible, persistent, entrepreneurial and journalistically competent. The SPARK program director is integral to every aspect of SPARK, including recruiting and selecting program participants, liaising with research administrators to determine strategic priorities, determining SPARK "pricing" (i.e., the cost to produce a SPARK-based story or video) and then generating funding and partnerships to pay them, promoting the program across campus, assigning stories, nurturing the stories and the participants, and giving feedback.

Perhaps the most difficult of these activities is generating funding. Initially, supporters gave financial resources to SPARK because they were philosophically aligned with the program and wanted to see more students develop an appreciation for research. More lately, with SPARK's track record now established, support is more likely to come

in the form of an agreement or contract for SPARK to write University of Guelph-based

research stories or produce University of Guelph research videos for a given client. Such

clients are openly promoted as SPARK sponsors on the masthead of the University's

Research magazine and on the SPARK program home page.

However, getting enough funding to support up to a dozen students involves a

concerted effort, one which may be uncomfortable for journalists who move into

corporate communications and are suddenly called on to raise money. It is not difficult to

explain what SPARK support is used for, because everyone involved in the SPARK

model benefits in some way from SPARK activity. Nonetheless, fundraising skills are

not typically in the toolbox of a journalist in the same way as, say, mentoring skills,

which are likewise vital to program success. The editor-reporter relationship in

journalism is typically a mentoring role, much like the relationship between the SPARK

coordinator/director and SPARK participants. But editors are not usually fundraisers.

Support from professional on-campus fundraisers, such as the university's

development office, would help prospective SPARK-program institutions that have a

journalist mentor, but not a journalist-fundraiser mentor. SPARK has never been an

official fundraising line item for the University of Guelph development office. However,

it could appeal to a broad base of alumni who support seeing their alma mater publicized

widely through the media, while simultaneously supporting the development of student

research-writing and broadcasting specialists.

The SPARK model could be tested elsewhere at willing institutions by starting the

same way the program at Guelph started: two participants, five hundred dollars (or so) in

start-up money from a donor, five or six supportive faculty willing to explain their

research to participants, and a media venue willing to print or broadcast SPARK stories. Success could be measured by media uptake of the stories and through some analysis of stakeholders' receptiveness to the stories, perhaps through a quantitative analysis seeking to understand whether SPARK stories increased the stakeholders' understanding of the particular research topic.

The advent of social communications should make feedback about SPARK faster than ever and be more accommodating of dialogue with stakeholders. Unlike the classic Shannon-Weaver mathematical model (See Figure 3) of communications, the SPARK model presented in Figure 24 recognizes feedback as an integral part of the communications/knowledge translation and transfer process. However, the SPARK model shares a basic truism with the Shannon-Weaver model, which is the connection between the message and the recipient. Shannon and Weaver show the message being manipulated as it is transmitted and travels through a medium, ultimately reaching the receiver. In the SPARK model, students manipulate the message, determine the channel medium, connect with stakeholders, then receive feedback – provided they have faculty members to interview, administration (including a mentor) to support them, sponsors to help fund them and media (including social media) to feature their stories. That in essence describes the SPARK model for student learning in knowledge translation and transfer in Ontario.

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Appendices

Appendix A.
Chronology of SPARK program growth

_____

1989   SPARK (Students Producing Articles on Research Knowledge) launched with *Ontarion* newspaper writers Andrew Wagner-Chazalon and Greg Smith.

1990   Pioneer Hi-Bred Limited becomes founding SPARK sponsor with support ($500) from its Community Development Fund.

1992   First *Research* magazine produced with student-written articles; SPARK receives first professional recognition when SPARK writer Sherry MacKay wins gold for best news release from Canadian Farm Writers' Federation.

1994   SPARK wins gold the first time the "Best New Idea – Creativity on a Shoestring" category is offered in Canadian Council for the Advancement of Education awards.

1995   Photography added to SPARK portfolio; Program name changed to Students Promoting Awareness of Research Knowledge; First "SPARKPlug" new column appears in the *Guelph Mercury.*

1997   SPARK receives silver award for publications and newsletters from international organization, Agricultural Communicators in Education; First SPARK article appears in *Milk Producer* magazine.

1998   University of Guelph receives gold award from Canadian Council for the Advancement of Education for "Best Private- Sector Partnership" for the OMAFRA enhanced partnership with SPARK; *Country Guide* magazine publishes SPARK news briefs.

1999   Natural Sciences and Engineering Research Council provides start-up funding for a national SPARK prototype program at 10 Canadian universities, using Guelph expertise and the Guelph SPARK model.

2001   First video award -- partnership with *Town and Country Ontario* TV show earns SPARK writer Dale Duncan a bronze award for television news reporting from the Canadian Farm Writers' Federation.

2002   SPARK's *PigPens* newsletter about pork research at Guelph wins silver award for best newsletter from the Canadian Council for the Advancement of Education; First article in *Ontario Beef* magazine.

2003   SPARK receives international recognition and gold award for "Best Media Relations Program" from Agricultural Communicators in Education.

2005   SPARK receives Agri-Food Innovation Award in communications category from the Province of Ontario; national Advanced Foods and Materials Network releases its first issue of *Advance*, written and co-ordinated by SPARK.

2007   SPARK begins contributing research radio news to CKNX; SPARK articles published in *Ontario Wheat Producer* and *Greenhouse Canada.*

2008   SPARK receives gold award for technical publications from Association for Communication Excellence.

2009   SPARK receives silver award for webcast "Building Bridges for Agriculture" by SPARK participant Arthur Churchyard from Canadian Farm Writers Federation.

2010   International Federation of Agricultural Journalists launches first broadcast awards program, which includes silver award to SPARK participant Natalie Osborne for feed efficiency research story, broadcast on CKNX radio online. SPARK publications and associated activities win six awards from Association for Communication Excellence, the most ever for SPARK at an annual competition.

Appendix B.
SPARK writer handbook

SPARK Writer Handbook

2nd Edition

Your guide to everything SPARK
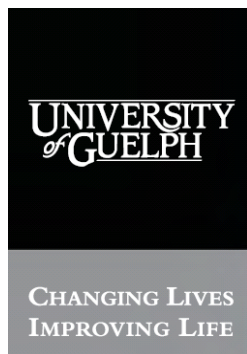
THE UNIVERSITY OF GUELPH

September 17, 2008

By Andrea Hruska

SPARK Writer Handbook

Your guide to everything SPARK

Table of Contents

1. ABOUT SPARK

a. History

"Since its inception in 1989, SPARK has grown to be an essential part of the research communication network at the University of Guelph. In this time, SPARK has gained national and international recognition and realized many achievements. For example, SPARK was deemed "Best New Idea" in Canadian university and college communication units by the Canadian Council for the Advancement of Education (CCAE) in 1994. A year later, SPARK snagged the silver award from other Canadian and American university programs in the Council for Advancement and Support of Education's (CASE) "Individual Student Involvement Program" category."[2]

b. Goal/Mission

c. Publications

"Research magazine highlights the University's diverse research strengths in a concise news format. Published twice a year, each issue focuses on a specific area of research activity."[3]

Topics such as equine, water, and projects funded by CFI are examples of some topics covered

Research magazine is one of SPARKs largest projects

This is newsletter publication that gives a brief glance and updates about research projects happening around the University of Guelph

It is only released once a year and preparations usually begin in September

No specific topic is assigned to the newsletter

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[2] (University of Guelph, 2007)

[3] (University of Guelph, 2007)

"*ADVANCE* magazine is the official publication of the Advanced Foods and Materials Network. It promotes dialogue and understanding about sophisticated research of foods and materials across Canada."[4]

The magazine is written in English by SPARK writers and translated into French for the second half of the magazine

Five magazines have been completed so far and each is released in the winter

The research covered in this magazine is complex so writing for Advance poses a challenge for some writers

Each four page newsletter covers a specific topic of interest. For example the last newsletter focused on plant agriculture. Past topics have included DNA barcoding, Latin America, and sustainable farming

There are 13 archived newsletters at http://www.uoguelph.ca/research/publications/Focus_On.shtml if you would like to have an idea about the different topics that have been featured

MaRS Landing

Human health and food come together in this newsletter published by MaRS Landing

MaRS Landing was created in 2002. Since then the acronym for MaRS has been dropped

The advisory board consists of the University of Guelph VP of Research and various directors and ministers from the Ontario government

For more information about MaRS Landing visit www.marslanding.ca

Other

SPARK writers are featured in the Guelph Mercury, The Ontario Corn Producers magazine, The Ontario Wheat Producers magazine, Ontario Farmer magazines (ON Dairy, ON Beef, ON Poultry, ON Pork), the Ontario Milk Producer magazine, the Ontario Cattlemen's Association magazine and **online** through the Canadian Farm Business Management Council's website www.farmcentre.com

You could also be writing stories about many different topics for many different magazines, newsletters, or newspapers

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[4] (University of Guelph, 2007)

*See Writing Your Story section first, and then come back to this page ☺

2. FORMATS

a. Standard: 500 words

Lead

Every story will begin with a lead. Whether it is a single sentence or a few will depend on the type of story you are writing. The lead should tell the reader what the story is about in an interesting way; this is your chance to catch the reader's attention. Knowing the angle of your story and what you want the story to accomplish will help when writing a lead. See section 7. A GREAT LEAD for detailed instructions and guidance for writing a lead.

Nut

This is the paragraph that

Quote

After the nut comes the quote. For more information about recording a quote during your interview please go to section 5. a. Note-taking. For information about finding a good quote please go to section 8. WHAT MAKES A GOOD QUOTE.

Subsequent Paragraphs

After the lead, nut and quote you can put as many other paragraphs and quotes as you would like as long as you stay within your word count. It may be helpful to finish the story with an emotional quote. This sometimes wraps up the story nicely instead of finishing with statistics or more information.

Shown below is an example of a standard story found in _____ Magazine Spring 2008.

b. Short story: 100 words

c. Update: 100-350 words

d. News Release: 500 words

e. Other

Writing Your Story

3.   RESEARCH

Research should be conducted before you go to the interview with the professor. Begin by looking up the professor through the University of Guelph website by simply searching the professor's name. A bit of background knowledge is all you should need, nothing too extensive is required.

Next, read over your lead and for each word that you are unfamiliar with type it into Google. Sometimes a Wikipedia article will be the first link Google provides you with. It is okay to use a Wikipedia article but remember that some information may be incorrect; use Wikipedia as base for your research and branch out from there.

You must familiarize yourself with the topic. Information that is easily understood from reading an internet article is all that is expected. This will save time during the interview because you will already have an understanding of the professor's topic leaving ample time to discuss details and results. It will be an overwhelming experience if you interview a professor and every single word he/she says is new to you. Of course you can't prepare yourself for everything but any word in your story lead that you are unsure of should be understood before you head to the interview.

After your research is complete write down a few questions you have about what you've found. Use these in the interview if you need to but you should also come up with a few more based on the story lead you were given.

4.   SETTING UP THE INTERVIEW

Starting your research and setting up the interview should happen around the same time. It's easy to set up an interview but a few guidelines will help make your first few times flow a bit smoother.
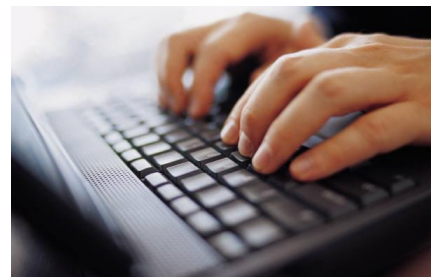
Start by searching the professor's name on the University of Guelph website in the directory. The directory should provide you with an e-mail, phone extension, department, and office location. Each is important for contacting the professor and ensuring that the spelling of their name and department is correct in your story.

Shown below is an example of an e-mail you can use as a template when writing your own. A good point to remember is that if you don't get to the point of your e-mail (you need an interview based on their research study) some people may only skim the e-mail if they don't think it's important or spam.

"TITLE: SPARK writer interview for _____
Magazine/Newsletter/Newspaper

Dear/Hello Prof. _____ ,

My name is _____ and I'm a SPARK writer at the University of Guelph in the Office of Research. Your research study about _____ has been selected for an article in the upcoming _____ Magazine/Newsletter/Newspaper.

At Students Promoting Awareness of Research Knowledge (SPARK) we have a unique editing process that includes the researcher's approval of the story before it goes to print. This process ensures scientific accuracy and allows SPARK to maintain our standard of quality.

I was hoping to schedule an interview with you at your convenience to discuss your research project. Thank you for your time and have a great day!

Sincerely,

[Your Name]
Students Promoting Awareness of Research Knowledge (SPARK) Writer
University of Guelph
Office of Research
Telephone: 519-824-4120 ext. 56638
E-mail: _____@uoguelph.ca"

Follow up the e-mail with a phone call. Some professors check their e-mail more often then their voicemail and vice versa. There is no way to know so it's best to try to contact them by both means. Let them know you sent an e-mail as well especially if you are leaving them a voicemail message; this will cut down on the time of the message because you won't have to repeat all that you mentioned in the e-mail.

5. THE INTERVIEW

It's easy to write all about what happens in an interview but for first-time SPARK writers it isn't about what's going on at the interview; it's how you feel before. Relax! The best advice for your first interview is "relax and be yourself." Also, go prepared. This will help a lot with the nervousness. Remember that the professors are people just like you!

At the beginning of the interview, remember to explain the SPARK editing process to the researcher. This will put them at ease knowing that if there is a miscommunication during the interview the science facts can be corrected later. But, do try your best to understand the ins and outs of their project.

a. Note-taking

So you've made it to your interview. This is where you get all the information you need for your story and more. It's always best to have more information than you need because it gives you options to choose from and allows you to pick the best points to emphasize.

At first it may be strange to sit with someone and not look at them while having a conversation. You'll get used to it after a few interviews.

When taking notes, it may help you to split the page in half. On one side record what the researcher says and on the other jot down notes. These notes can be anything you like. Some writers jot down questions to ask the researcher later in the interview. Some put stars to highlight important points and others simply don't use this method at all. It is entirely up to you!

Develop some short forms for words so that during the interview you can quickly record points. Another way to ensure quick writing is to bring a good pen that you can write quickly with while still being able to read your notes.

You don't need to write down everything the researcher says. Sometimes they will begin to go off topic and in that case you don't need

to record details about their vacation in Europe. Facts, statistics, results, definitions, emotional quotes, and anything else related to your story angle are important.

b. Question brainstorming and improvisation

Before you go to your interview you should have some questions written down on your notepad. These could have stemmed from your research or from the story lead.

Basic questions that need to be answered at the end of the interview are: who, what, where, when, why, how, and so what/who cares?

So what/who cares is very important. This is your lead; it is the point of the story that is going to catch the reader's attention and entice them to continue from one paragraph to the next. Don't directly ask the research so what or who cares? You need to dig this up yourself by asking strategic questions about their research.

Starting the interview with "Tell me about your research project" is your best bet. This will get the ball rolling and help you to develop some questions to ask when they finish their explanation.

If you don't understand a term or word a researcher uses as for the definition. Don't be afraid to ask these seemingly simple questions; not everyone is a specialist on all topics. This is where some improvisation can come into play during the interview. You don't need to follow the questions on your notepad if they aren't providing you with the answers you need. If the researcher mentions anything interesting ask some more questions about it. DO be curious. DO take an interest in their findings. DON'T expect the researcher to give you all the information you need; you have to ask the right questions, sometimes in several different ways, to get the perfect quote or fact that you need.

If you find the researcher is becoming to too technical an easy way to get them to break it down would be to say "How can we explain this to the general public?" or "Help me explain this to our readers."

End the interview with "Who else have you collaborated with on this project? Specifically anyone you feel should to mentioned in the story." Sometimes if you don't mention "anyone that should be mentioned in the story" they will give you everyone and anyone who took part in the project. The end of every SPARK story lists the funding sources for the project so be sure to ask where they received support from. Ask the researcher if it would be alright to contact them by phone or e-mail if you have any further questions or clarifications while writing.

Now that you made it through the interview you can begin the writing process.

6. ORGANIZING YOUR STORY

a. Preparing to write

b. Tackling a tough science story

7. A GREAT LEAD

a. Hard vs. Soft leads

8. WHAT MAKES A GOOD QUOTE

9. CP STYLE GUIDE FOR SPARK

The Canadian Press (CP) published the CP Stylebook for use in editing and writing. This helps keep the style of SPARK stories consistent and accurate. A lot of the news you see everyday was written by a journalist at the Canadian Press. If you would like to read more about the Canadian Press please go to www.thecanadianpress.com.

At SPARK there are a few key CP style guidelines to follow when writing. This list is not exhaustive and if you are incorrectly using CP style you don't need to worry, you'll be corrected by another SPARK writer or the coordinator. It's best to record all CP style guides as you come across them.
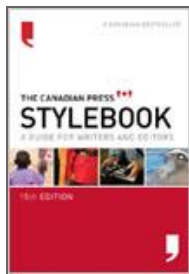
Use contractions (can not is can't)
Make full use of hyphen where you can
Number under 10 should be written (5 is five) and 10 and above are written by using digits (13 is not thirteen but 13)
Use because instead of as
Don't personify food
Avoid "them" "they" try using something more specific like "the doctors" or "consumers"
If you are writing a list there is no comma after the second last item. For example: the cats, dogs, birds and hamsters escaped from their cages.

10. EDITING YOUR OWN WORK

11. TIPS AND TRICKS

12. RESOURCES

"On Writing Well: 30th Anniversary Edition" by William Zinsser
Read Part 1: Principles and chapter 9, 12 and 15
This book is an easy read and believe it or not it's enjoyable
William Zinsser adds humour and excellent examples
A copy of the book should be available at the SPARK coordinators
desk

University of Toronto writing website

"Journalism Resources" white binder
This binder is located in the office and is helpful if this guidebook
leaves you with any unanswered questions

SPARK written magazines
Before you write your first story it is highly recommended that you
read a Research magazine from front to back
This will help give you an idea how a SPARK story should read
Of course the stories that are published have gone through many edits
so don't worry about perfecting your story on your first write

Any other SPARK writer
Your peers can offer you some great advice. Ask any other SPARK
writer for help if you need it
Getting your work peer edited before you send it to the SPARK
coordinator is helpful for catching mistakes you may not be able to
see if you've been working on your story for a while

The SPARK coordinator
Don't be afraid to ask the SPARK coordinator anything you are unsure
about
The SPARK program is a learning experience for the students so you
aren't expected to know everything

Appendix C.
SPARK focus group moderator guide

Moderator: Hello and welcome to our focus group session. Thank you for taking time to join our discussion today and bring your perspectives on the program we're all familiar with called SPARK, Students Promoting Awareness of Research Knowledge. My name is Mark Waldron and I am a professor emeritus at the University of Guelph, and a professional facilitator. My background is in broadcasting, rural extension and education.

You have been invited here because you can provide valuable information about how your experiences contributed to the development of SPARK. Your experiences and opinions today about the program will be used to help turn it into a model that can be described to others, and perhaps used by them to develop their own SPARK programs.

Before we begin, let me share some things that will make our discussions easier and more productive. There are no right or wrong answers; all points of view are welcome. Please feel free to share your point of view even if it differs from what others have said. Please speak up and only one person should talk at a time.

We will be recording your comments on a flip chart. You can see what will be written, and if you think I have misinterpreted your comment as I write it down, please let me know. No electronic recording will take place. In my written report that comes from this focus group, no names will be attached to comments. You can be assured of as much confidentiality as possible.

However, you should be aware a lack of confidentiality is possible for a focus group. The degree of confidentiality depends on the participants themselves and their commitment to a free, open and confidential discussion. It is vital to not discuss what others say in the group, once the group has disbanded.

We'll be on a first-name basis, and in my written report no names will be attached to comments. You can be assured of as much confidentiality as possible.

My role here is to ask questions and listen. I won't be participating in the conversation, but I want you to feel free to talk with one another. I'll be asking around 15 questions, and I'll be moving the discussion from one question to the next. Sometimes there is a tendency in these discussions for some people to talk a lot and some people not to say much. But it is important for us to hear from each of you today because you have different experiences. So if one of you is sharing a lot, I may ask you to let others respond. And if you aren't saying much, I may ask for your opinion.

Our session will last about two hours and we will take a break half way through. If you have your cell phone with you, I'd appreciate it if you could turn it off while we are in the discussion.

Introductory questions

Moderator: Let's begin by getting to know more about you. I would like to go around the room and have you introduce yourself. Please tell us the following:

- your first name
- your academic major at the University of Guelph
- what you're doing now
- how long you were involved in SPARK

Now again, let's go around the room and ask some more individual questions.

SPARK and you

- When someone said, or says "what's SPARK?" how do you respond?

- What is your most memorable SPARK moment, or experience?

- Did SPARK influence your career choice? If so, how, and if not, why not?

- What specific, tangible skills would you say you acquired at SPARK?

- Do you think the program has been successful? Why or why not? How would you measure the success of SPARK?

- Did it matter to you that you got paid? Did it matter that the program was sponsored in part by industry? Did you feel any influence, and in what way?

- Would you have participated even if you didn't get paid?

The SPARK model

- What are SPARK's strengths and weaknesses? If you were to improve on SPARK – if it was your program at Guelph, or elsewhere – what would you change?

- Please draw a model of SPARK on the accompanying pieces of paper. Who is involved? Who is impacted?

- Name four parts of the SPARK model.

- Name five things you think other institutions really need to know about SPARK to start a program of their own.

- Do you think they *should* start their own SPARK program? Could SPARK succeed elsewhere, or only in Guelph?

The big picture

Moderator: SPARK received a lot of support in the early days from the vice-president of research at the time, Dr. Larry Milligan, because he thought research communications were essential for creating a culture within Canada that was supportive of a science-based society, one that existed in an environment of innovation.

- Is indeed SPARK more than a job where you learn journalistic techniques? Does it have a cultural role?

- When you were a SPARK student, how did you describe the experience to your friends and family? Did you see yourself as part of a bigger picture?

- How do you describe the movement of students and/or graduates like yourselves in society who have an accelerated appreciation and/or understanding of research?

Knowledge translation and transfer

Moderator: A new approach to innovation is called knowledge translation and transfer. People sometimes stumble on the term, but think about it – first, you translate the knowledge into understandable terms, then you "transfer" it to users by, in SPARK's case, using traditional or new media (newspapers, radio, television versus the Internet). The research hypothesis at the centre of tonight's focus group is based on the belief that SPARK has a role to play – one that's it's been playing for the past 20 years, in fact -- in translating university research, and transferring research activity and accomplishments to users – farmers, consumers, the media, etc.

- What do you see as SPARK's role in knowledge translation and transfer? Who can do it better or more efficiently? Should the job be left to "professionals"? Why or why not?

- What could SPARK be doing that it isn't now, to translate and transfer knowledge?

- In the innovation diffusion model, the one that begins with innovators and ends with laggards, where should SPARK be concentrating its efforts…on those who are going to innovate anyway, or on those who don't appreciate the need for it? How can SPARK get to those people?

Concluding remarks

I am now going to try to summarize the main points from today's discussion. (key messages and big ideas that developed from the discussion) The main points were…

- Is this an adequate summary? Do you have anything to add?

Moderator: As was explained at the beginning of the session, the purpose of this focus group was to gather information about how your experiences contributed to the development of SPARK. Your experiences and opinions today about the program will be used to help turn it into a model that can be described to others, and perhaps used by them to develop their own SPARK programs.

- Have we missed anything or are there any other comments?

Moderator: Thank you for taking time out of your day to share your opinions. Your participation is greatly appreciated and has provided valuable insight into this topic. Out of town participants, please see me on your way out for your compensation. Thanks again.

Appendix D.
Stakeholder focus group moderator guide

Moderator guide and questioning route for stakeholders

Moderator: Hello and welcome to our focus group session. Thank you for taking time to join our discussion today and bring your perspectives on the program we're all familiar with called SPARK, Students Promoting Awareness of Research Knowledge. My name is Mark Waldron and I am a professor emeritus at the University of Guelph, and a professional facilitator. My background is in broadcasting, rural extension and education.

You have been invited here because you can provide valuable information about how your support and involvement with SPARK contributed to its development. Your experiences and opinions today about the program will be used to help turn it into a model that can be described to others, and perhaps used by them to develop their own SPARK programs.

Before we begin, let me share some things that will make our discussions easier and more productive. There are no right or wrong answers; all points of view are welcome. Please feel free to share your point of view even if it differs from what others have said. Please speak up and only one person should talk at a time.

We will be recording your comments on a flip chart. That way, you can immediately see what is being written, and if you think I have misinterpreted your comment as I write it down, please let me know. No electronic recording will take place. In my written report that comes from this focus group, no names will be attached to comments. You can be assured of as much confidentiality as possible.

However, you should be aware a lack of confidentiality is possible for a focus group. The degree of confidentiality depends on the participants themselves and their commitment to a free, open and confidential discussion. It is vital to not discuss what others say in the group, once the group has disbanded.

My role here is to ask questions and listen. I won't be participating in the conversation, but I want you to feel free to talk with one another. I'll be asking around 15 questions, and I'll be moving the discussion from one question to the next. Sometimes there is a tendency in these discussions for some people to talk a lot and some people not to say much. But it is important for us to hear from each of you today because you have different experiences. So if one of you is sharing a lot, I may ask you to let others respond. And if you aren't saying much, I may ask for your opinion.

Our session will last about two hours and we will take a break half way through. If you have your cell phone with you, I'd appreciate it if you could turn it off while we are in the discussion.

Introductory questions

Moderator: Let's begin by getting to know more about you. I would like to go around the room and have you introduce yourself. Please tell us the following:

- your first name
- your profession
- how long you have been involved with SPARK, and in what capacity

Now again, let's go around the room and ask some more individual questions.

SPARK and you

- When someone said, or says, "What's SPARK?" how do you respond?

- What is your most memorable SPARK moment, or experience?

- What specific, tangible skills would you say you are acquired by SPARK participants?

- Do you think the program has been successful? Why or why not? How would you measure the success of SPARK?

- Do you think it matters that the SPARK participants are paid for their work. What other incentives could be put forward? Do you think paying the participants gives the appearance of influence, and in what way?

The SPARK model

- What are SPARK's strengths and weaknesses? If you were to improve on SPARK – if it was your program at Guelph, or elsewhere – what would you change?

- Please draw a model of SPARK on the accompanying pieces of paper. Who is involved? Who is impacted?

- Name five things you think other institutions really need to know about SPARK to start a program of their own.

- Do you think they *should* start their own SPARK program? Could SPARK succeed elsewhere, or only in Guelph?

The big picture

Moderator: SPARK received a lot of support in the early days from the vice-president of research at the time, Dr. Larry Milligan, because he thought research communications were essential for creating a culture within Canada that was supportive of a science-based society, one that existed in an environment of innovation.

- Is indeed SPARK more than a job where participants learn journalistic techniques? Does it have a cultural role?

- How do you describe the movement of students and/or graduates in society who have an accelerated appreciation and/or understanding of research?

Knowledge translation and transfer

Moderator: A new approach to innovation is called knowledge translation and transfer. People sometimes stumble on the term, but think about it – first, you translate the knowledge into understandable terms, then you "transfer" it to users by, in SPARK's case, using traditional or new media (newspapers, radio, television versus the Internet). The research hypothesis at the centre of tonight's focus group is based on the belief that SPARK has a role to play – one that's it's been playing for the past 20 years, in fact -- in translating university research, and transferring research activity and accomplishments to users – farmers, consumers, the media, etc.

- What do you see as SPARK's role in knowledge translation and transfer? Who can do it better or more efficiently? Should the job be left to "professionals"? Why or why not?

- What could SPARK be doing that it isn't now, to translate and transfer knowledge?

- In the innovation diffusion model, the one that begins with innovators and ends with laggards, where should SPARK be concentrating its efforts…on those who

are going to innovate anyway, or on those who don't appreciate the need for it? How can SPARK get to those people?

Concluding remarks

I am now going to try to summarize the main points from today's discussion. (key messages and big ideas that developed from the discussion) The main points were…

- Is this an adequate summary? Do you have anything to add?

Moderator: As was explained at the beginning of the session, the purpose of this focus group was to gather information about how your experiences contributed to the development of SPARK. Your experiences and opinions today about the program will be used to help turn it into a model that can be described to others, and perhaps used by them to develop their own SPARK programs.

- Have we missed anything or are there any other comments?

Moderator: Thank you for taking time out of your day to share your opinions. Your participation is greatly appreciated and has provided valuable insight into this topic. Thanks again.

Appendix E.
University of Guelph trust fund notification

Fax To: Lynne Harbin   836-3278

UNIVERSITY OF GUELPH
RESEARCH GRANT
SET-UP _x__ OR CHANGE____ REQUEST FORM

Grant Number: 046155

Grant Name: **Ontario Pork Publication**
***** maximum 50 characters*****

Project Leader: **Roberts O**

Funding Agency: O   **40360**   **Ontario Pork**
                 numeric value   **maximum 50 characters**

Sponsor Code: M   **7000**   **Sponsor Category: O**   I

Award Type: O   **G**   **Grant Type: M**   **02**

Unit Number: M   **0088XX**   **Amount Awarded: O**   **$16,835**

Start Date: M   **01 Feb. 04**   **End Date: O**   **31 Jan. 05**

Anniversary Date: M   **04**   **Status: M**   **O**

Restriction: M   **R**   **Interest: M**   **N**

Category: M   **N**   **Reference #: O**

Comment: O
****maximum 50 characters****

Legend: M= Mandatory   O= Optional

Authorization: *Crnette Coache*   **Date:**   **4-Feb-2004**
               Office of Research

Copies to: **Faculty**   **Admin**   ✓ **Communications**

*****Following to be Used by Financial Services Only*****

Entered By: **Date:**
               Controller's Office

FRS 2K ACCESS:

Revised: Nov 12 1999   ****PLEASE PRINT CLEARLY****

Appendix F.
Research Communications director job description

Director, Research Communications
University of Guelph

The Director, Research Communications is responsible for the strategic direction of research communications for the university, including setting communication priorities and overseeing the multi-faceted activities of research communications staff.

The director is the editor of the University of Guelph Research magazine, the thrice-yearly strategic publication dedicated to describing the university's research accomplishments and activities to a broad audience of stakeholders. The director cooperates with the Director, Communications and Public Affairs, on matters such as funding announcements, external news releases, institutional photo gallery contributions and awards competitions, and with the director co-chairs the campus-wide communicators' liaison committee.

The director has oversight for establishing, nurturing and generating resources for programs that connect the research enterprise with University of Guelph students. This includes the Students Promoting Awareness of Research Knowledge (SPARK) program, the Studies in Undergraduate Research at Guelph (SURG) undergraduate research journal, Project SOY, Seed of the Year, Canadian Agricultural Communicators of Tomorrow, and other student awareness, recruitment, education, supervision and development activities designed to enhance students' understanding, support and communication of research.

Key activities include the ooverseeing and directing of research communication such as:
- Serve as main professional staff member responsible for University of Guelph Research magazine.
- Provide direction, creative and technical support and initial and final editing review of all internal and external research communications emanating from Office of Research, including print publications, audio and video/multimedia initiatives
- Identify research stories for communication through personal contact with AVPRs, researchers, department deans and chairs
- Review trust fund notifications for story leads and discuss with SPARK coordinator for strategic targeting in stakeholder publications
- Monitor production processes and work with graphic designers for specialized communication initiatives
- Establish, nurture and generate resources for programs that connect the research enterprise and University of Guelph students, namely Students Promoting Awareness of Research Knowledge (SPARK) program
- Serve as staff advisor to Studies in Undergraduate Research at Guelph (SURG) undergraduate journal. SURG editor reports to director, research communications.
- Serve as staff advisor to Project SOY, Seed of the Year, Canadian Agricultural Communicators of Tomorrow, and other student awareness, recruitment, education, supervision and development activities designed to enhance students' understanding and support of communication of research.

Appendix G.
Research communications unit
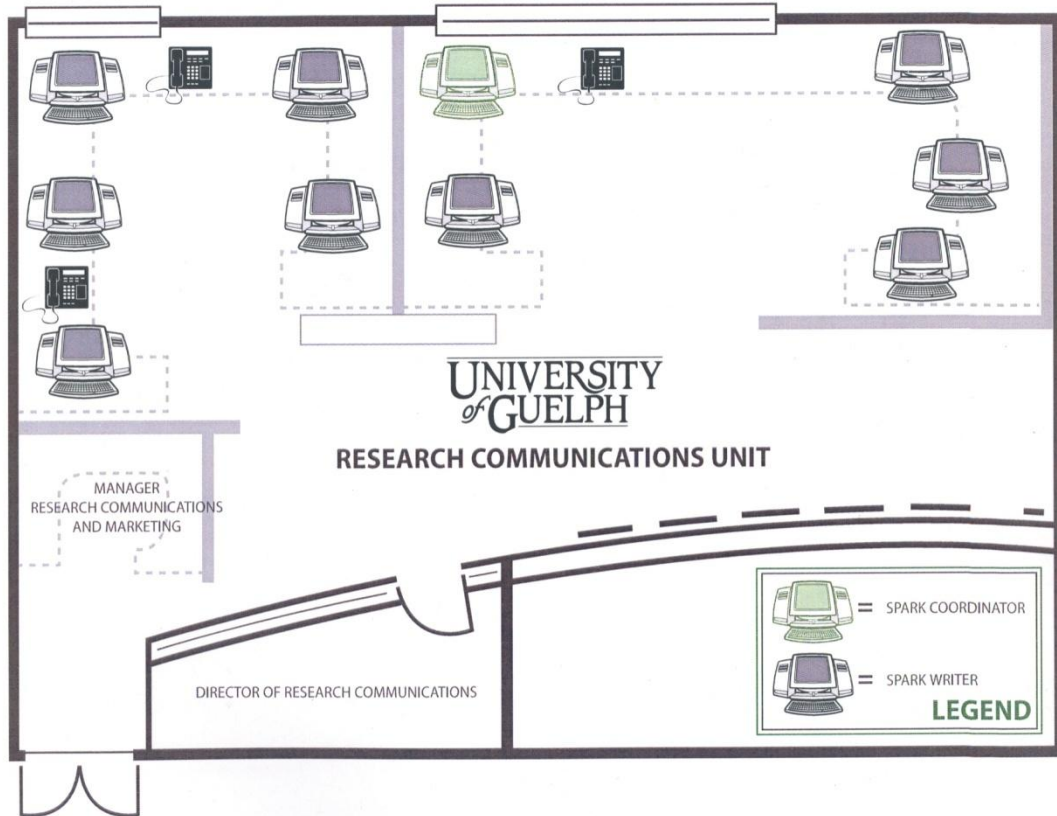
Appendix H.
Email correspondence to SPARK participants

Gryph Mail Gryph Mail and Calendar   owen@uoguelph.ca

Revised proposed date for SPARK focus group	Tuesday, November 17, 2009 5:24:24 PM

From: owen@uoguelph.ca

To: courtney_denard@hotmail.com; knudds@annexweb.com; ccarson@sentex.net; jsabljic@uoguelph.ca; leslie.irons@gmail.com; achurchy@uoguelph.ca; douglasa@uoguelph.ca; lmclean@aofp.ca; rfieldho@uoguelph.ca; patdickenson@hotmail.com; clare.illingworth@syngenta.com

Attachments: Application - SPARK moderator guide REVISED November 15 2009.doc (55.5KB)

Hi Courtney, Kristy, Carol, Clare, Joey, Leslie, Arthur, Anne, Lisa, Pat and Rob,

I'm pleased to tell you I have received approval from the University of Guelph Research Ethics Board to proceed with the focus group related to my doctoral dissertation, *A model for student learning in knowledge translation and transfer in Ontario*.

I'm sorry the last attempt to hold this focus group had to be postponed. The proposed new date is:

Tuesday, November 24, 7-9 p.m., OAC Boardroom (104 Johnston Hall).

Can you please let me know if you are able to participate in this session? I hope you can!

I'm attaching the discussion guide for this event from moderator Prof. Mark Waldron, to help you understand the focus group's intent and direction.

Thanks,

Owen

* * *

Owen Roberts, P.Ag. (Hon.)
437E University Centre
University of Guelph
Guelph, Ontario, Canada N1G 2W1
519-824-4120 Ext. 58278
Ontario Agricultural College office: 107 Johnston Hall Ext. 58278
One Stone Road office: 519-826-5207

Director, Research Communications and SPARK
Coordinator and Instructor, Agricultural Communications Program
Doctor of Education candidate, Texas Tech/Texas A&M universities
Secretary General, International Federation of Agricultural Journalists

Celebrating 20 years of SPARK 2009-2010

Appendix I.
Email correspondence to SPARK stakeholders

Gryph Mail: owen@uoguelph.ca   Page 1 of 1

Gryph Mail Gryph Mail and Calendar   owen@uoguelph.ca

SPARK stakeholders focus group meeting   Monday, November 30, 2009 5:33:38 PM

From: owen@uoguelph.ca

To: ecassavoy@thestar.ca; len@marketing911.ca; andrewd@uoguelph.ca; lmclean@aofp.ca;
andrew.campbell@farms.com; kdavidson@ecomente.ca; jgreig@bowesnet.com;
ryada@uoguelph.ca; jeff.schieck@ontario.ca; bmcbride@uoguelph.ca;
Robyn.Meerveld@ontario.ca; gecker@uoguelph.ca; judy.shaw@syngenta.com

Bcc: wilda@albedo.net

Attachments: Application - Stakeholder moderator guide November 30 2009.doc (55KB)

Hi all,

Further to our various conversations and phone messages, I'm pleased to invite you to a focus
group designed to gather your thoughts and opinions on SPARK for my doctoral dissertation, *A
model for student learning in knowledge translation and transfer in Ontario*. The focus group,
consisting of SPARK stakeholders, will be held Monday, December 7, 2009, 9-11 a.m., in the
OAC boardroom, 104 Johnston Hall.

I'm attaching the moderator's guide so you can see the course the discussion will take. The event
will be moderated by Prof. (emeritus) Mark Waldron, a professional facilitator.

Please let me know if you have any questions. This will make more sense when you hear the
message on your phone mail, if you haven't done so already, and review the moderator's guide.

Ed, Len, Lisa and Andrew D, please note: The focus group will run from 9-11 a.m. (not 9:30 a.m.
- 11:30 a.m. as previously thought).

Thanks,

Owen

* * *

Owen Roberts, P.Ag. (Hon.)
437E University Centre
University of Guelph
Guelph, Ontario, Canada N1G 2W1
519-824-4120 Ext. 58278
Ontario Agricultural College office: 107 Johnston Hall Ext. 58278
One Stone Road office: 519-826-5207

Director, Research Communications and SPARK
Coordinator and Instructor, Agricultural Communications Program
Doctor of Education candidate, Texas Tech/Texas A&M universities
Secretary General, International Federation of Agricultural Journalists

Celebrating 20 years of SPARK 2009-2010

https://zcs3.mail.uoguelph.ca/zimbra/?client=preferred&client=preferred   4/10/2010

Appendix J.
SPARK output and knowledge transfer

SPARK output and knowledge transfer

<u>Internal</u>

Output/Partner	Details/Description
Business Development Office	The Business Development Office enables U of G faculty, staff and students to maximize the potential of their research, through licensing agreements and other instruments, and facilitating knowledge transfer to commercial interests. SPARK works with the BDO on technology translation and transfer by producing news stories, news releases and videos of strategic research developments and activities.
CANPOLIN	The CANPOLIN network is truly national in scope, bringing together 44 researchers from 26 institutions across the country. Research activities fall under four themes (Pollinators, Plants, Ecosystems, and Prediction and Economics), with extensive connections between themes. SPARK writes news stories and produces video based on CANPOLIN activities.
Equine Guelph	Equine Guelph is the horse owner's centre at the University of Guelph, supported and overseen by equine industry groups, dedicated to improving the health and well-being of horses SPARK writes 500-word articles for the Equine Guelph research newsletter, which is published twice a year. It is included in the following publications: *Whoa!* (Ontario Equestrian Federation's newsletter), *Canadian Thoroughbred* and *Canadian Sportsman*.
Focus On	*Focus On* is a series of themed newsletters highlighting U of G research. Produced by the SPARK program, each four-page newsletter helps communicate Guelph's strengths in a particular area of research. Articles are approximately 300

words in length.

iBOL	The International Barcode of Life Project (iBOL) is dedicated to assembling the sequence library and the technology necessary to identify organisms rapidly and inexpensively. This goal is underpinned by the observation that sequence diversity in short, standardized gene regions (DNA barcodes) enables both the identification of known species and the discovery of new ones. SPARK works with iBOL to develop news stories, videos and publications.
Research Facts	SPARK contributes news briefs to *Research Facts*, the annual guide to research at the University of Guelph.
Research Magazine	*Research* magazine highlights the University's diverse research strengths in a concise news format. Published three times a year, each issue focuses on a specific area of research activity. *Research* is written and produced by SPARK, which also produces videos for the magazine's electronic version.
Simcoe Research Station	The Department of Plant Agriculture publishes a Simcoe Research Station newsletter with Fall, Winter and Spring/Summer editions describing current departmental events, future events, and highlights personnel and ongoing research activities in the department. SPARK provides 150-200 word stories.
Various academic departments	SPARK works with specialized academic departments at U of G, such as the physics department, to produce timely research articles on some of their most notable projects.

External

Output/Partner	Details/Description
Advanced Foods and Materials Network	SPARK writes and coordinates *Advance,* an annual 24-page magazine highlighting research activities of AFMNet. This Includes coordination of design and layout, photography and printing. *Advance* magazine is the official publication of the Advanced Foods and Materials Network. It promotes dialogue and understanding about sophisticated research of

foods and materials across Canada.

Canadian Poultry	SPARK writes research articles for *Canadian Poultry*, a monthly magazine representing the chicken, egg, turkey and hatching egg production sectors. The magazine covers, promotion, health, politics and research. Each article is about 500 words.
CFBMC	The Canadian Farm Business Management Council is the only national organization in Canada devoted exclusively to developing and distributing advanced farm management information. SPARK writes one 500-word article monthly.
CKNX Radio	SPARK contributes radio news stories to CKNX, which covers a vast area in Ontario's biggest agricultural region.
Dairy Farmers of Ontario	The *Milk Producer* magazine is the monthly publication of the Dairy Farmers of Ontario. SPARK provides one 500-word research article per month.
Farms.com	SPARK creates agriculture and food research videos and uploads them onto the farms.com site, one of agriculture's biggest electronic portals. First video posted July, 2009.
Grain Farmers of Ontario (wheat, soybeans, corn)	The Ontario Soybean Growers, the Ontario Corn Producers' Association and The Ontario Wheat Producers' Marketing Board amalgamated to create the Grain Farmers of Ontario. SPARK writes research news briefs for the *Grain Farmer* magazine.
Greenhouse Canada	SPARK writes up to five 500-word articles on plant and greenhouse research for this national magazine.
Guelph *Mercury*	The Guelph daily newspaper publishes a weekly column ("SPARKplugs") on current research at the University of Guelph, written by SPARK. First started appearing in 1995.
Kinross	SPARK provides five research stories on environmental remediation by University of Guelph researchers at Kinross mining sites.
Ontario Beef Farmer	*Ontario Beef Farmer* has been providing up-to-date information to the province's beef industry for 14 years.

SPARK provides one story per issue.

Output/Partner	Details/Description
Ontario Cattlemen's Association	SPARK writes beef-focused research articles for the monthly Ontario Beef magazine, with each article 500 words in length. The Ontario Cattlemen's Association publishes *Ontario Beef*.
Ontario Dairy Farmer	SPARK contributes articles on dairy research news for the magazine (500-word articles).
Ontario Hog Farmer	SPARK writes one 500-word research news article per issue.
Ontario Poultry Farmer	Ontario Poultry Farmer is a glossy quarterly publication that provides pertinent information to the province's egg, chicken and turkey producers. SPARK writes one 500-word story per issue.
SHARC Bytes	The newsletter highlights SHARCNET (Shared Hierarchal Computing Network) research, events and activities, to help create a better understanding of the uses and importance of high-performance computing. SPARK contributes stories twice a year, approximately 500 words each.

Other

Output/Partner	Details/Description
Project SOY (Four partners: Monsanto Canada, Ontario Soybean Growers, Soy 20/20, Ontario Ministry of Agriculture, Food and Rural Affairs)	SPARK coordinates Project SOY, promoting the program, coordinating presentations, serving as main contact for students and faculty, liaising with sponsors and organizing the final award presentation.
Seed of the Year/SeCan	SPARK is the headquarters for the eastern Canada the Seed of the Year competition, which recognizes publicly developed Canadian seed varieties that have made a significant contribution of the agri-food industry. SPARK promotes the competition, writes media releases, organizes an awards luncheon, media relations and industry sponsor

liaison.

CanACT

CanACT, Canadian Agricultural Communicators of Tomorrow, is the first international chapter of the US-based National Agricultural Communicators of Tomorrow. It is designed for students with a keen interest in agricultural communications. The SAPARK newsroom is headquarters for CanACT.

SURG

Studies by Undergraduate Researchers at Guelph (SURG) is a refereed, multi-disciplinary electronic journal that publishes research articles by University of Guelph undergraduate students. The SPARK newsroom is the headquarters for *SURG*.

Appendix K.
University of Guelph *Research* magazine

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Appendix L.
University of Guelph RIB approval

RESEARCH ETHICS BOARD

UNIVERSITY of GUELPH

Certification of Ethical Acceptability of Research
Involving Human Participants

APPROVAL PERIOD:	November 16, 2009 to November 16, 2010
REB NUMBER:	09OC018
TYPE OF REVIEW:	Delegated Type 1
RESPONSIBLE FACULTY:	M. Waldron
DEPARTMENT:	Office of Research
SPONSOR:	N/A
TITLE OF PROJECT:	A Model for Student Learning in Knowledge Translation and Transfer in Ontario

The members of the University of Guelph Research Ethics Board have examined the protocol which describes the participation of the human subjects in the above-named research project and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement.

The REB requires that you adhere to the protocol as last reviewed and approved by the REB. The REB must approve any modifications before they can be implemented. If you wish to modify your research project, please complete the Change Request Form. If there is a change in your source of funding, or a previously unfunded project receives funding, you must report this as a change to the protocol.

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Responsible Faculty, the safety of the participants, and the continuation of the protocol.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research protocols.

The Tri-council Policy Statement requires that ongoing research be monitored by, at a minimum, a final report and, if the approval period is longer than one year, annual reports. Continued approval is contingent on timely submission of reports.

Membership of the Research Ethics Board: M. Dwyer, *Legal Representative;* M. Fairburn, *Ethics and External;* D. Emslie, *Physician;* B. Ferguson, *CME;* Lachapelle, S. *COA;* J. Minogue, *EHS;* Saunders, P. *Alternative Health Care and External;* Spriet, L. *CBS;* L Trick, *Psychology;* J. Tindale, *FRAN,* T. Turner; *SOAN.*

Approved: _____   Date: _____ NOV 2 6 2009 _____
per
Chair, Research Ethics Board

Appendix M.
Texas Tech University RIB approval

TEXAS TECH UNIVERSITY
Research Services

January 20, 2010

IRB Coordinator
Ofc of Research Services
Mail Stop: 1035

Regarding: 502233 A Model for Student Learning in Technology Translation and Transfer in Ontario

Dr. IRB Coordinator:

The Texas Tech University Protection of Human Subjects Committee has approved your proposal referenced above. The approval is effective from January 15, 2010 through December 31, 2010. This expiration date must appear on all of your consent documents.

You will be reminded of the pending expiration approximately eight weeks prior to December 31, 2010 and asked to give updated information about the project. If you request an extension, the proposal on file and the information you provide will be routed for continuing review.

Sincerely,

Rosemary Cogan, Ph.D., ABPP
Protection of Human Subjects Committee

203 Holden Hall | Box 41035 | Lubbock, Texas 79409-1035 | T 806.742.3884 | F 806.742.3892

An EEO/Affirmative Action Institute

Appendix N.
Coding for SPARK participants

"It gave us a lot of practical work experience to show potential employers"
"It was a beginning and a start for a career in communication. The practical applications proved useful"
"I used SPARK skills to improve writing for other courses"
"It was the only practical experience that I had at University that I left University with"
"The skills acquired are valuable in the real world where success depends on individual skills"
Building a student's portfolio and resume
Providing students with skill development in the practical aspects of being a communicator
Giving students practical experience
Opportunities for students to learn on the job
Project management skills
Oral communication skills development
Teamwork
Working under pressure
Journalistic skills, writing skills and the ability to capture an audience
Includes a practical component, enables time to develop a portfolio

"It opened the door to contacts, to people outside our personal areas"
Develop respect for other communicators and to researchers in departments
Networking, professionalism and leadership

Professional skill development

Professional development

Skill development

Figure A-1. Professional development and skill development for SPARK participants

"Receiving payment gave us professional dignity as well as helping set a priority in terms of scheduling time"
"It helped in knowing how to market oneself"
It is an opportunity for personal development and a chance to meet outsiders.
"I got an article published in the Globe and Mail and I won a Farm Writer's Award for it which added mileage to my resume"
"It gave me confidence to know that I could write"
Self confidence
"We probably would have participated without being paid but the pay was important in that it gave us a feeling of being valued. It makes us feel professional, when paid and kept us motivated. I was only later that I realized the value of the experience beyond the dollars"
"The opportunities available helped us feel mentored and gave us confidence for doing such things as television interviews"

Professional development

Skill development

Students are good at handling the gap between professional terms and everyday terms
It shows students and professors working together such as SPARK articles in the Globe and Mail
Learning to interview professors

Interviewing

Knowledge translation

Figure A-2. Professional development and skill development for SPARK participants

Cutting fluff, getting to the main message
Using effective language; taking myself out of the story
Getting rid of vague language and psyching out the real message
"Researchers don't have time to communicate information. They can't really communicate or translate ideas into everyday terms"

Writing

Skill development

The clientele focus for SPARK is external (newspapers, etc.)
It is a public relations vehicle for the University and for stakeholders as well as for financial backers

Connecting research and industry

Connecting students with the broader community
It shows the importance of research to the community at large
From the cultural perspective, SPARK helps students learn different approaches to people and show the community what is going on in research. This helps avoid the ivory tower syndrome and breaks down barriers between researchers and the public
It involves technology transfer, bridging the gap between researchers and the community through communication

Connecting research community

External

Knowledge transfer

It is a way for professors to promote themselves outside their own area
Promotes research information on campus, between departments, a form of internal communication

Connecting research within the institution

Internal

Figure A-3. Skill development and knowledge transfer for SPARK participants

Appendix O.
Coding for SPARK stakeholders

It is a critical experience in
journalism training
Excellent writing and journalism
skills
Quick learning, e.g. using audio
and video
Communication presence,
organizational skills, time
management skills, applicable
writing and interviewing skills
It is realistic and excellent for
journalism training
Participation helps in building a
portfolio of experience for future
employment
SPARK cultivates people skills,
connections, networking
especially through attending
conferences
Potential employers need to look
at the added depth of the résumé
of SPARK students; writing
experience of this nature helps
move SPARK students up the
potential interview list. It also
makes it easier to get references
and assessments of future
employees

Practical skill
development

Skill
development

The value of being paid is very
important. It is professional pay
for professional work
Success can also be measured by
its level of professionalism
The respect for sound science
Discipline of being a
professional communicator....
Professionalism
"I think they were able to handle
stress well and to work in a very
professional manner

Professional skill
development

Confidence
Awareness, depth, openness
Self starting skills

Personal skill
development

Figure A-1. Skill development and knowledge transfer for SPARK stakeholders

Internal

Researchers have an inward focus; SPARK opens doors

Interviews

They learn how to tell a good story on complicated topics
They learn how to present an accessible format and have the skills to deliver
Translating the tech talk using the right words

Writers

Knowledge translation

Bridge between research and the public
It is effective because it seems to bypass the bureaucracy
SPARK's role focuses on a results oriented product and shows the value that can be obtained from technology transfer
An important role is to put the University of Guelph on the map and on the media map. It serves as media relations and outreach for the whole university. It helps translate research to the lay person
Communicate the value of research to the public; they need to see how it impacts on their lives

External

Knowledge transfer

"It is kept below the radar for survival! It doesn't surface in the university inside power struggles, e.g. rivalry with the Communications Department. It has evolved and now needs to explore where it should sit vis-a-vis university structures. It should stay with the research office."

Internal

Figure A-2. Skill development and knowledge transfer for SPARK stakeholders

It needs more public relations so that people will know what they do

There needs to be more awareness of SPARK both at the University and in the general public

It could be broader than just Ontario

The problem is that the general public still doesn't really realize the importance of research and that there isn't only one answer.

It is still important to get the information out despite alternative philosophies

There is a need for it to communicate more about what it does and its successes

Self promotion

SPARK is a very good investment. It costs a pittance for the value produced. It gives a high return on the dollars invested

It needs strong corporate support

Base financial support is required

Research granting agencies (NSERC), need to subsidize such SPARK type programs. It needs people to promote and support the idea of technology transfer

Funding

Knowledge infrastructure planning

It has almost outgrown what they were set up to do

It needs to interact more with the journalism field

It could be transferred but the university needs to believe in it

The model is here, it works here and maybe could be expanded to other locations

There needs to be an overlap between champions. The transition will be critical

A succession plan for SPARK is critical now that it is twenty years old

Future planning

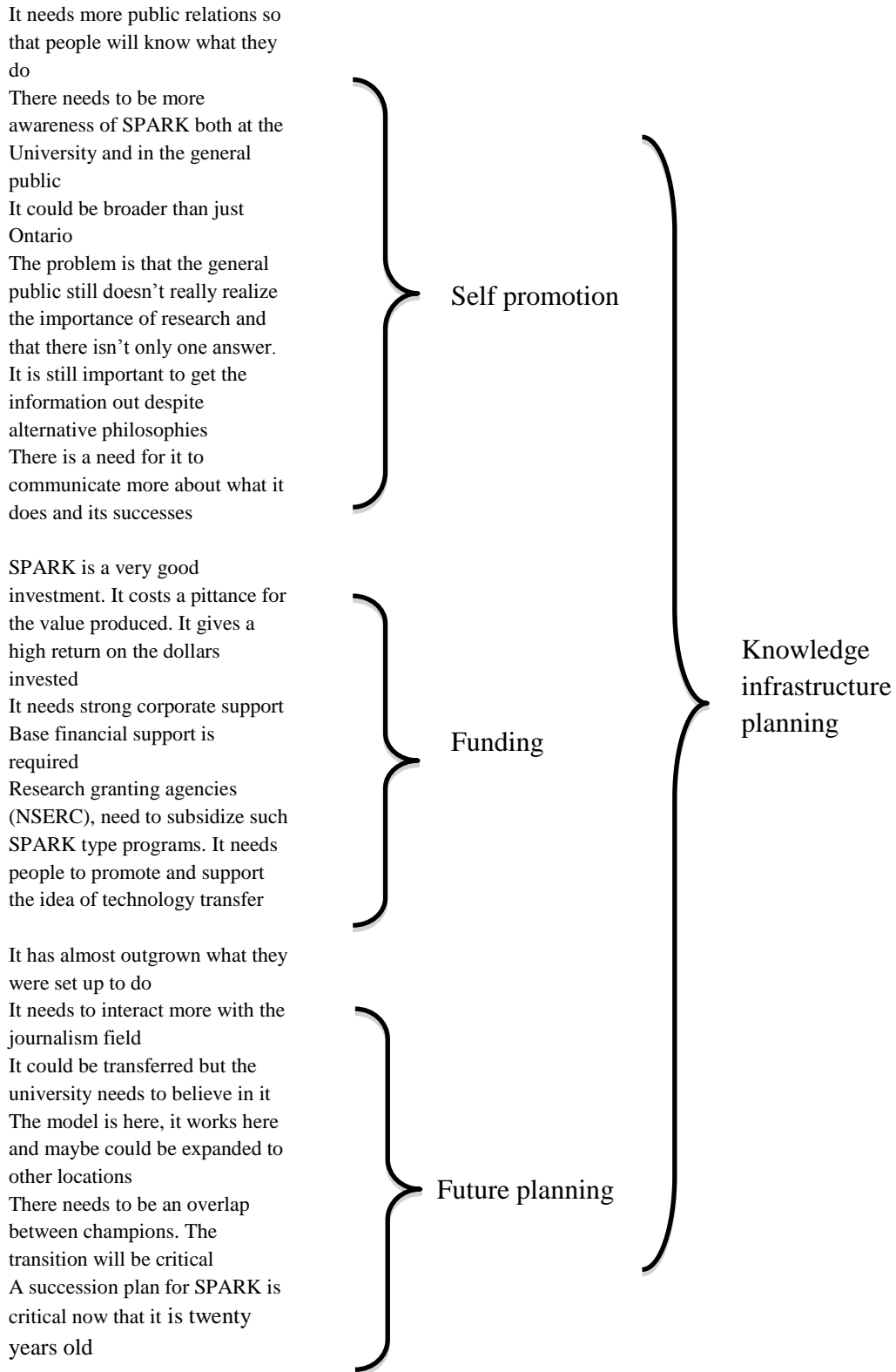Figure A-3. Skill development and knowledge transfer for SPARK stakeholders