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Exploring Teachers' Participation in an Online Professional Social Network

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Abstract

Exploring Teachers' Participation in an Online Social Networking Site

This thesis considers new ways of facilitating in-service teacher training and development in Trinidad and Tobago. ICT is linked by policy to National Development and teachers are urged to use available tools and technologies to enhance student learning. I argue that current models of training and professional development do not result in sustained and efficient use of some of these tools. In this study, a new model of teacher professional development is considered where a learning space is created and mediated through Web 2.0 tools and the Internet. In particular, the use of a social networking space is designed purposefully as a professional learning space for teachers. The design elements were selected to facilitate a dynamic learning environment catering to flexibility in teachers' learning needs and wants. Through analysis of teacher interactions, the data shows how the social network supports the development of a professional identity while allowing teachers to seek support from one another and to share knowledge. Examination of teacher activity reveals how teachers chose to participate in this space and their preference for certain tools and topics. It further shows the inclination to seek knowledge rather than to share and their willingness to upgrade their skills using free online learning courselets. This study concludes that a social network can act as a professional learning space that enables teachers' ongoing learning through real-time communication with peers, just-in- time support from mentors and coaches and opportunities to make their practice public.

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Operational Definitions

Web 2.0 tools

Web 2.0 is an umbrella term for a host of recent internet applications such as social networking, wikis, folksonomies, virtual societies, blogging, multiplayer online gaming and 'mash-ups'. Whilst differing in form and function, all these applications share a common characteristic of supporting internet-based interaction between and within groups, which is why the term 'social software' is often used to describe web 2.0 tools and services". (Selwyn, 2008,p. 4).

Educational Affordances

Educational affordances are often defined as those characteristics of an artifact that determine if and how a particular learning behavior could possibly be enacted within a given educational context (Kirschner, Strijbos, Kreijns and Beers, 2004,p.10).

Social Media

Social media "is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content" (Kaplan and Haenlein, 2010, p. 61).

Social Networks

Social network sites are "web‑based services that allow individuals to (1) construct a public or semi‑public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site" (boyd and Ellison, 2007, p. 211).

Social Networking

"We define Social Networking as the practice of expanding knowledge by making connections with individuals of similar interests. In the Web 2.0 environment, social networking is linked to technological services and software that make it possible for people to communicate with others from anywhere, at any time. (Gunawardena, Hermans, Sanchez, Richmond, Bohley and Tuttle, 2009, pp.2-3)

Social Networking Sites

> Social networking sites are online spaces that can be customized to a large extent by their users, providing space for personal profiles which users complete in order to make connections with others". (Gunawardena, Hermans, Sanchez, Richmond, Bohley and Tuttle, 2009, pp.2-3)

Google

> A popular search engine that allows users to access information by typing in key words or web addresses.

Ministry of Education

> An office of the government of Trinidad and Tobago that manages all affairs related to Early Childhood, Primary and Secondary education.

Secondary School Teacher

> A teacher in the secondary school system in Trinidad and Tobago who is a subject specialist such as Mathematics or Social Studies.

Participant

> A person who was registered on the site www.techtalk.spruz.com and set up a user profile.

Visitor

> A person who viewed the site www.techtalk.spruz.com but may not be registered. The site is available on the Internet and can be accessed directly or though search engines such as Google.

1   Introduction

This thesis is primarily concerned with the ways that teachers in Trinidad and Tobago have participated in an online social networking space that has specifically been designed for them to connect, share and learn from one another. In this introduction, I provide a background to my study, which serves to contextualize the issues related to teacher professional development in Trinidad and Tobago, especially related to initiatives with using technology in the classroom. I also provide a background to my role as Curriculum Officer in the Ministry of Education and present my concerns in supporting the practice of secondary school teachers.

1.1   Background to the Study

Teachers have been expressing dissatisfaction with the way professional development has been made available to them. Professional development is viewed as a means to assist teachers in acquiring skills and expertise in content, pedagogy and technology. In Trinidad and Tobago, many of these programmes are government-initiated and meant to fill gaps in teacher expertise but are often unpopular with teachers as they are felt to be "not of high quality" (Borko, 2004, p.3), "episodic, myopic … and disconnected from the realities of classrooms" (Darling-Hammond et al., 2009, p. 2). Teachers are faced with a number of demands from politicians, administration, students and the community at large. Changing curricula and large-scale asessments, more diverse school populations and the introduction of new technologies and tools have impacted teachers' practice.

In recent times, there has been an exponential growth in demand and supply of wireless Internet services locally, which enables access to the Internet and Web services such as social media. Mobile technologies have also made communication faster and easier. However, there is a delay in the use of these new technologies in schools. Technology-rich classrooms require teachers to constantly retool themselves, especially because of the rate of production and adoption of new technologies on the global and local landscape. Teachers are expected to be at least minimally competent in the use of Web 2.0 tools but they often lag behind their students in acquiring and mastering new tools and even view these technologies as disruptive (Caillier and Riordan, 2009). There is research that points to the potential for technology to transform education (Farooq, Schank, Harris, Fusco and Schlager, 2007; Ray, Kalvaitis,

Wheeler and Hirtle, 2011) by advantaging the learner in a participatory and social way of learning (Anderson, 2008b; Davies and Merchant, 2009).

In an effort to equip secondary schools with twenty-first century tools such as high speed Internet access and laptops, there has been a greater emphasis on developing technology infrastructure than on suitable training for teachers in effectively harnessing the affordances of these tools in the classroom. Curriculum officers in the Ministry of Education are expected to support teachers in curriculum implementation by providing training and support in new pedagogies and strategies. But resources are often inadequate to provide effective training and there is a continued emphasis on 'one-off' workshops at a central training centre. This may be attributed to top-down approach to professional development where training is handed out to teachers regardless of interest. This training approach often demotivates teachers from distant schools to attend and is also unpopular with teachers with very demanding work schedules. Teachers often become frustrated with professional development because it is ineffectual or requires large investments of time they do not have (Dede, Ketelhut, Whitehouse, Breit and McCloskey, 2009). In particular, teacher professional development programmes for integrating technology have been accused of focussing on "how to operate the technology" than on pedagogy (Hew and Brush, 2007; Lawless and Pelligrino, 2007) and portray "a lack of knowledge of how teachers learn" (Lieberman, 1995, p.75).

It is no surprise, therefore, that there has been less than satisfactory returns on investments into technology acquisition and teacher training (Ward and Parr, 2010.). Perhaps this is so if information and communication technologies are used in ways that fit in easily with traditional and existing instructional practices (Matzen and Edmunds, 2007) such as use of Microsoft PowerPoint for 'telling' and the web for 'research'. As such, "the use of powerful technologies is often limited to sustaining rather than transforming educational practice" (Levin and Wadmany, 2008; Ertmer and Ottenbreit-Leftwich, 2010). But teachers often face challenges within their schools while attempting to implement new methods and techniques that they may have acquired at workshops/seminars. Secondary schools in Trinidad and Tobago are not designed for collaboration as classrooms are far apart and teachers' staff rooms are inadequately resourced. Additionally, they may suffer from lack of administrative support in implementing new techniques. The literature reveals a persistent problem of teachers' classrooms being off-limits to their colleagues and this disadvantages them from learning from one another (Darling-Hammond, et al., 2009; Lieberman and Mace, 2010)

which denies them the opportunity to work collaboratively either through observation or research or team-teaching. This often leads to teacher isolation and a further reluctance to learn new pedagogies and approaches. This points to a need to explore alternative ways of supporting teachers in the classroom as they practice.

1.2   Research Imperatives –The need for Effective Teacher Professional Development Opportunities

Current research is leaning towards professional development activities that are purposefully aligned with teachers' interests, time available to learn, work schedules and ease in networking with colleagues of similar interests. Shifts to teacher professional learning have been described as important to effective practice (Feinman-Nemser, 2008) and investigating non-traditional approaches to supporting teacher learning is encouraged. Opportunities to connect and share with other teachers can be made possible through online learning spaces such as social networking sites that harness the affordances of Web 2.0 tools (Brady, Holcomb and Smith, 2010; Davies and Merchant, 2009; Greenhow, Robelia and Hughes, 2009; Ozkan and McKenzie, 2008; Schlager, Farooq, Fusco, Schank and Dwyer, 2009). Online social networking is a new way for teachers to access professional development opportunities which allow for the embedding of asynchronous, synchronous, or blended learning tools that are inexpensive and scalable (Whitehouse, 2011). Popular social networks like Facebook are considered primarily for making connections among people. As such, social networks are not currently viewed by educators as likely to promote professional learning (Anderson, 2006), but much of the learning potential of Web 2.0 comes from the ability of its' participants to engage actively in constructing their own knowledge in a shared space, which can offer participants a flexible and "participatory experience of learning" (Selwyn, 2008, p. 10) which does not have to take place in a formal setting like a seminar/conference room. Accessibility to colleagues and knowledge offers teachers an opportunity to engage in professional learning that is not otherwise possible with the realities of timetable schedules and transportation challenges. There is a current research challenge to explore and investigate the use of online social networks for teachers and ways to design them for professional learning.

As a curriculum officer with the Ministry of Education whose responsibility in part has been to support teachers in improving their classroom practice, I have found difficulty in reconciling scanty allocation of resources for the provision of high-quality teacher

professional development programmes. A lack of a comprehensive professional development policy for teachers also creates difficulties for those who wish to engage in professional development on their own. There are no incentives for promotion after obtaining professional development certification nor are there structures to support teachers while pursuing professional upgrade in terms of class schedules and school demands. The prevailing view by Government officials and school administrators alike is that teachers should use their private time, such as the July-August vacation, and money to engage in professional development so that it does not interrupt the smooth running of school. Teacher frustration with existing forms of professional development is seen and felt at many levels and my review of the literature supports what I consider to be a 'one size fits all' approach to teacher professional development which fails to recognize teachers as individuals so instead of building a culture of professional learning, teachers are faced with a "culture of compliance" (Lieberman and Mace, 2008, p. 277).

In this study, I explored whether an online social networking space could therefore be considered for teacher professional learning, and to see whether it might be able to provide an informal, affordable and flexible way for teachers to learn from colleagues, mentors and experts as they attempt to integrate technology. I wanted to see whether engaging teachers with the tools that they need to use in the classroom could help them to gain confidence in technology integration. Web 2.0 tools have made communication and connectivity much faster and easier than before and are viewed by some researchers as having the potential to transform education for both students and teachers (Greenhow, Robelia and Hughes, 2009). Setting up a social networking site thus afforded me the opportunity to research the learning potential of the Web for teacher professional learning and to focus that effort on secondary school teachers in Trinidad and Tobago.

1.3   Significance of Research Study

This study focuses on teachers' participation in an online professional social network and explores whether participation in this space can lead to learning. As an ICT curriculum officer with the Ministry of Education in Trinidad and Tobago, I decided to design a website that was specifically for Trinidad and Tobago teachers, to meet the need of local teachers. There is a complaint that teachers cannot source lesson plans or resources aligned to our National curricula and that resources found on the World Wide Web are predominantly suited to that of foreign curricula and systems.

There are a number of global teacher networks that local teachers may access and benefit from through international linkages. However, there is a critique that teachers may come to know more about foreign curricula and school practices than their own. There has been a regional drive to make curricula more relevant to the needs of Caribbean people, but the production of local materials and spaces for teachers to network and voice concerns about their practice are less seen. The legacies of colonialism are sustained in our educational systems even though there is a continuous focus on educational reform to match global and local needs. I focus my study on the use of a space that would allow teachers to connect, share and learn from each other. I selected an educational online social networking site for this purpose. While social networking sites are largely known for making connections with people, they are also repositories of data. As such, this site was designed to give voice to Trinbago teachers and facilitate a space for local content. I believe that a study like this is viable in Trinidad and Tobago at this time as Internet access is provided free of charge to all secondary schools.

This study can also be valuable in a wider Caribbean context, where our professional development practices reflect that of a top-down education system which bears the legacy of the colonial British. There is an opportunity to move away from this traditional top-down approach to teacher professional development, and explore a design that supports teachers' involvement in the activities in which they are interested and which are authentic, relevant and flexible and can be sustained over time.

I also selected a research design that was participatory that would allow teachers a voice in their learning and selected to focus the site on teachers with a special interest in integrating technology in the classroom. Despite widespread use of social media among young adults and the stated affordances of Web 2.0 tools for connectivity, there is still inadequate research into how to use social media and social networking sites for learning (Conole, Galley, and Culver, 2011). My study provides an exciting opportunity and a challenge for me to network with teachers and to explore the possibilities of teachers' learning, situated in a virtual environment.

1.4   My Positionality

I decided to adopt an action-research methodology for this study because I wanted to change the way professional development was offered to teachers. As I was concerned with difficulties that teachers face in their practice, I wanted to select an action that would support them in light of their interests and daily schedules. This meant that teachers, as participants, would have a chance to get involved in the design and implementation of the study, which would be a change from traditional top-down approaches. I have been a secondary school teacher for more than 18 years and as Curriculum Officer, I work with teachers all the time. As such, I believe that this study can not only provide important information about alternate approaches for teacher learning which could inform my practice, but also benefit teachers.

1.5   Research Questions

The aim of this study was to explore teachers' participation in an online social networking site that had been designed for professional learning. I posed the following research questions for this study:

1. How do teachers participate in an online professional social networking site?
2. Are there benefits to teachers for participating in an online professional social network?
3. Can teachers' participation in an online professional social network lead to learning?

1.6   Organization of the Study

This study is divided into several chapters. Chapter 1 has described the context of the problem, purpose of the study, rationale, and research questions. Chapter 2 is a review of the literature on teacher professional development and learning, online social networking sites in education and participation in these spaces. Chapter 3 describes the methodology and methods of data collection and analysis used in conducting the study as well as ethical considerations. Chapter 4 describes the design and customization of the social networking site for secondary school teachers. Chapter 5 presents findings and trends from the data. Chapter 6 provides a discussion of findings and an examination of research questions while Chapter 7 provides concluding statements of the study.

2   Literature Review

This research examines how teachers participate in an online social networking site that has been designed for professional learning. It seeks to add to the growing body of literature on alternate models of professional development for teachers and how online spaces that embed Web 2.0 tools can afford participants new ways of learning. To facilitate this process I conducted an in-depth review of available literature to gain an understanding of the issues surrounding teacher online participation in social network sites including literature about the use of available Web 2.0 tools and what constitutes teacher professional learning. Assertions by researchers such as Anderson (2008); Davies and Merchant (2009); Greenhow, Robelia, and Hughes (2009) and Selwyn (2008) support the idea that social networking sites can be explored for use in educational contexts. I have searched through books and electronic and print journal articles found in databases and collections, available through the University of Sheffield, UK (online), the University of the West Indies, Trinidad and the RCLRC Library, Ministry of Education, plus conference proceedings from AACE, ACM, SITE and Asciilite to perform this review. I have found studies with interest in how popular social networks like Facebook and Twitter are used by students and faculty in higher education. Other studies tend to focus on pre-service teacher preparation but models for practicing teachers in secondary schools are less prevalent. Hence I have drawn significantly on research studies done with pre-service teachers at a college or university and to a limited extent on students' social media use.

I have organized the literature review into three parts in order to address three major research concerns in this study. In Part one, I examine trends in using online social networks in education and the potential affordances of Web 2.0 technologies in the teaching/learning environment. In Part two, I describe existing theories of learning to provide suitable lenses for understanding how teacher learning can occur in networked collaborative online environments. Finally, I review literature on what constitutes participation in online learning spaces and in particular in online social networks to inform me about potential benefits of teachers participating therein.

2.1   Part one- Online Social Networking Sites

In this part of the review, I look at issues and findings related to the impact of Web 2.0 technologies in the teaching/learning environment. I pay particular attention to online social networking sites and explore how these spaces have been used for educational purposes. This examination allows for a proposal for online social networks to act as a space for learning.

2.1.1   The Changing Face of Learning

There has been a noticeable and profound shift in the ways people today communicate with each other. The advent of the Internet as Web 2.0 has changed the face of communication and the way knowledge is shared (Dede, 2008). If we consider learning to be a change in knowledge, skills or abilities, or behavior/attitudes, then Web 2.0 may also have an impact on the way we learn. In a learning environment, Web 2.0 tools can enable a learner (regardless of age or other variables) to connect and collaborate in ways unimaginable before. Students, in particular, embrace the digital world of social networking (Selwyn, 2008) for social interaction. Rainie (2011) reports on Pew Internet findings about the increased use of the Internet and social media, which has changed the learning environment. The rapid rise in membership of Facebook as the most popular Social Network (2011 Pew Internet Report), has been noted by many researchers (DeSchryver, Mishra, Koehler and Francis, 2009; Roblyer, McDaniel, Webb, Herman and Witty, 2010).

Social networks have traditionally been associated with young people's desire to make their social relationships public and visible (Greenhow, Robelia, and Hughes, 2009) but have been transitioning into other areas of life such as education   (Roblyer, McDaniel, Webb, Herman and Witty, 2010). The combination of synchronous and asynchronous Web 2.0 tools on a social networking site presents users with a mechanism to be connected to each other while supporting individual thoughts and actions and goals even while being geographically dispersed. Learning in this context is less formal and structured (Dede, 2008) and as such can provide educators with the tools necessary to promote such an environment (Lockyer, Dawson and Heathcote, 2010).

Traditional learning spaces have been articulated in the form of educational or professional development institutions. Schools in particular have been considered as the place for student learning. Current research points to the changing landscape of the ways learning takes place, especially because of the power of Web 2.0 tools. There is a view that all spaces are

potentially learning spaces if they foster communication among participants (Oblinger, 2006). Informal learning spaces may be described as those where "learners live and learn at their discretion" (Cattier, 2006, p.8.2) and where learners choose the time and space to do work that flows from formal learning spaces. This concept, advocated by Brown (2005), referred to non-traditional learning spaces for students (outside the classroom), in formal institutions, but which I now apply to spaces for teachers due to the suggestion that much learning takes place outside formal spaces. By their nature, Web 2.0 technologies such as wikis, blogs and other social networking applications allow for the crossing of boundaries related to space and time and afford the user opportunities to be engaged in "technology-based informal learning at home and in the community" (Selwyn, 2007, p.2). Learning is described as a social process (Harasim, 2002) and ubiquitous social media utilize the power of Web 2.0 tools to bridge distances between people and to transfer control of learning from an instructor or trainer to the learner thus allowing the learner greater control over his/her learning. Given this shift in place of learning, research points to the creation of new learning spaces. Thus the classroom, outside the classroom, as well as professional development halls and colleges, all situate knowledge and learning (Putnam and Borko, 2000).

This shift provides fertile ground for research into ways that teachers can engage in learning that challenge traditional methods. It allows for an examination of the ways that professional development has been facilitated for teachers in Trinidad and Tobago and to explore alternate strategies to better meet the needs of practicing teachers who express a desire to connect with other colleagues and share best practices. Web 2.0 technologies can extend the reach of teacher professional networks through broadband and cloud technologies, which can help to mitigate against teacher isolation and stagnation in learning.

2.1.2   The Educative Affordances of Web 2.0

The term Web 2.0, coined in 2005 by O'Reilly, refers to the evolution of the World Wide Web from a 'read' web to a 'read-write' web because of its "participatory, collaborative and distributed" nature (Greenhow, Robelia and Hughes, 2009). While Lomicka and Lord (2009) argue that there is still little agreement on what the term Web 2.0 means, I find the definition by Selwyn (2008) useful to this discussion:

> "Web 2.0' is an umbrella term for a host of recent internet applications such as social networking, wikis, folksonomies, virtual societies, blogging, multiplayer online gaming and 'mash-ups'. Whilst differing in form and function, all these applications share a common characteristic of supporting internet-based interaction between and

within groups, which is why the term 'social software' is often used to describe web 2.0 tools and services". (Selwyn, 2008, p. 4).

Web 2.0 has caused a shift in the ways that people today interact with each other, exchange information and share knowledge. The term 'social media' is often used to describe technologies and applications that allow social interactions among people. Social media "is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content" (Kaplan and Haenlein, 2010, p. 61). These authors suggest that there are a number of different types of social media and identify collaborative projects (e.g. Wikipedia), blogs and micro blogs (e.g., Twitter), content communities (e.g., YouTube, Flickr, Picasso), social networking sites (e.g., Facebook), virtual game worlds (e.g., World of Warcraft), and virtual social worlds (e.g., Second Life). These applications allow users a variety of ways to collaborate, create and share content and socially interact.

The potential benefits that Web 2.0 technologies can bring to a user in his environment can be described by the term 'affordances'. This term, generally attributed to the perceptual psychologist, Gibson (1977, 1979), is a "can do" statement (Lee and McLoughlin, 2008, p.1) and refers to the 'enabling' action of the technology to carry out a specific task.

Educational affordances can be defined as

> "those characteristics of an artifact that determine if and how a particular learning behavior could possibly be enacted within a given educational context" (Kirschner, Strijbos, Kreijns and Beers, 2004, p.10).

Light and Polin (2010, p. 2) have created categories of Web 2.0 tools to be useful in deconstructing their potential educational affordances: "(1) tools that create or support a virtual learning environment, (2) tools that support communication and cultivate relationships (3) resources to support teaching and learning and (4) tools enabling learners to create artifacts representing what they are learning". Lee and McLoughlin (2008, p. 3826) also created four categories of potential affordances to learners as: "connectivity and support, Collaborative information discovery and sharing, Content Creation and Knowledge and information aggregation and content modification". These categories allow for an ease in selection of tools for their respective affordances. Social networking sites, which were designed primarily for enhanced communication and forging relationships among members can become more powerful if other tools are embedded.

Perhaps the most useful affordances of Web 2.0 tools to the context of learning are its potential to support long-term informal learning through socialization (Selwyn, 2007) and the enabling of learner-centred control (Lee and McLoughlin, 2008). But McLoughlin and Lee (2007, p. 667) warn that "just because social media provides these affordances does not mean that is all that is required for effective learning" and caution that affordances are those which are perceived by learners in their learning context. More current research points to the numerous ways in which Web 2.0 tools are being used in learning and this leads Conole, Galley and Culver (2011) to suggest that the term "social and participatory technologies" more accurately describes the affordances of Web 2.0 tools.

While some see the Web as a tremendous resource for information seeking and a forum for connectivity, concerns have been raised that include "the heightened disengagement, alienation and disconnection of learners who use Web 2.0 from education, and the detrimental effect that Web 2.0 tools may have on 'traditional' skills and literacies" (Selwyn, 2008, p.11). Researchers question the role of the Web in changing the way students interact and learn (Merchant, 2009; Yuen and Yuen, 2008) and Caillier and Riordan (2009, p. 491) hold the view that the Internet can single-handedly cause a "disruption of social, geographical, and disciplinary boundaries". It may be felt that students' informal learning can erode the importance of teachers and schools. Schools that fail to recognize that their students are immersed in the world of digital media where they are constantly connected to a knowledge source will add to the growing dilemma that "even when students are in school much of their education happens outside" (Collins and Halverson, 2010, p.19). The role of the teacher in attaining desirable learner outcomes does not diminish but becomes more challenging to guide students' use of Web 2.0 and to design learning activities which harness the resources therein (Bush and Hall, 2011; Ottenbreit-Leftwich, Glazewski, Newby and Ertmer, 2010; Pan and Franklin, 2010). And it is precisely the way that teachers view these changing learning landscapes and equip themselves with the tools and expertise necessary to meet new learning paradigms that provides ample opportunities for research.

2.1.3 Online Social Network Sites

While social networking applications have been described earlier as Web 2.0 tools, social network sites in turn, enable the embedding of Web 2.0 tools. As such, a social networking site can employ a combination of collaborative and content-creating tools that allow a number of educational affordances to users. Social Network Sites and social networking sites are both found in the literature and often used interchangeably with social media and there

can often be confusion about the difference among these terms. I have already described social media and now offer boyd and Ellison's (2007) explanation about social network sites, which is frequently referenced in the literature. They define social network sites as

> "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site" (boyd and Ellison, 2007, p. 211).

There is a need to distinguish between the terms 'networking' and 'networks' for the purpose of this study. boyd and Ellison (2007) clarify that 'networking' emphasizes relationship initiation while 'networks' maintain and support existing relationships. They suggest that users make their existing network of ties visible on social network sites. While online social network sites were initially developed to develop and sustain relationships among friends and colleagues for support, they have evolved to allow strangers to interact and establish their presence online. Facebook and LinkedIn, for example, were designed to help people expand their network of friends and can be described as Social Networking sites (Ozkan and McKenzie, 2008) as opposed to other types of networks which serve to maintain personal relationships. In these sites, users set up a profile, communicate with others on their network and share personal information about their likes, activities and history. In addition to setting up a user profile, other significant features of social networking sites that are significant, are that they provide multiple services and facilities to users through Web 2.0 tools that afford users enabled communication and collaboration. It is significant to note that these services are free (Ozkan and McKenzie, 2008) and require little effort (Ellison, Lampe and Steinfield, 2009).

This distinction between relationship initiation and maintenance raises difficulty for me as a researcher in a context of online networks of teachers, which allows for both the creation and maintenance of collegial relations. Both require just as much work. Further research has expanded my understanding of social networking as

> "the practice of expanding knowledge by making connections with individuals of similar interests. In the Web 2.0 environment, social networking is linked to technological services and software that make it possible for people to communicate with others from anywhere, at any time" . (Gunawardena, Hermans, Sanchez, Richmond, Bohley and Tuttle, 2009, p.2-3)

I now present a definition that helps me to proceed in my study. Social networking sites are

"Online spaces that can be customized to a large extent by their users, providing space for personal profiles which users complete in order to make connections with others". (Gunawardena, Hermans, Sanchez, Richmond, Bohley and Tuttle, 2009, p.3)

In my research, I am concerned with how educators communicate with each other, across distance and time, many of whom may not know each other from before and the building of relationships with new colleagues. As such, I use the term SNS, as Social Networking Site, to describe an online learning space where teachers in Trinidad and Tobago can seek out other colleagues with similar interests and to engage in professional sharing while enhancing their professional network base.

2.1.4   Online Social Networks in Education

Using social media and social networking sites is a new field of research and there are some exploratory studies in examining them for educational purposes. Research can be broadly categorized into student-focused or teacher-focused. Research on students' use of popular SNS's like Facebook, MySpace and Twitter has been gaining momentum (DeSchryver et al., 2009; FitzGibbon, Oldham and Johnston, 2007; Greenhow, 2007; Young and Kraut, 2011) as well as that of education-based SNS's like Ning (Brady, Holcomb and Smith, 2010; Casey and Evans, 2011; Moayeri, 2010).

Thus far, research conducted on teachers' use of SNS and social media has shown some diversity in focus and newer studies such as that of Chen and Bryer (2012) have focused on exploring faculty in higher education's use of social media for informal learning. Some studies have even focused on comparing students' and faculty use of social media (Goodman, 2010; Hew, 2011; Roblyer et al., 2010) and generally reveal non-surprising results that faculty use is significantly less than that of students. A number of barriers to teacher technology change has been noted by researchers (Ertmer, 1999; Lim and Khine, 2006) and these barriers can be categorized as first-order and second-order to refer to the degree of influence of the environment. There has been some growth in the presence of online teacher professional networks such as *Global Educators for All* and *Teachers' Network* and spaces such as Twitter, a microblogging social networking site, and LinkedIn, which allows for teacher-specific groups. I have found that several teacher networks are hosted on special interest network sites such as Ning, which may be described as an educational SNS's. These networks provide live models of how SNS can be used to engage teachers across large geographical spaces and educational contexts, but I have not yet found research literature on how they work or how teachers interact. Teachers in Trinidad and Tobago who join these

large-scale networks can interact with others from abroad and engage in a number of global issues but they do not adequately allow for conversations about topical issues or provide for local teachers to connect more closely with each other. Further, there is a need for teachers here to engage with and through local contexts, as much of what is shared has to be adapted for local use and interpretation.

In order to identify and understand issues related to the use of social networks in education, related to practicing teachers, I have looked for studies that would inform me of reasons for their success and how members participated. In studies related to students' interactions and participation in a collaborative learning environment, there has been some evidence that learning takes place. Some of these studies, focused on using social networking sites, showed greater depth of engagement (Stepanyan, Mather and Payne, 2007), increased bottom-up collaboration (Dron and Anderson, 2007) and increased participation through social learning (Shin and Lowes, 2008). Moayeri (2010) reported success in using a *Ning* site as a space for showing and sharing students' work and claimed that the site allowed students to recognize themselves as a collective and as a community. Casey and Evans (2011) described an action-research study that used *Ning* in an Australian school setting and examined students' reactions and online activity while using a range of social media and Web 2.0 tools and concluded that *Ning* is a dynamic learning environment where interactions are random and unpredictable leading to a disturbance in understanding student learning and curriculum implementation.

In the realm of teacher education, I have found significant research focused on pre-service teacher preparation in college settings (Velasquez, Graham and McCollum, 2009; Yuen and Yuen, 2008) and on specific case use of familiar Web 2.0 applications such as blogs and wikis (Davies and Merchant, 2009; Deng and Yuen 2011; Lin, 2008; Loving, Schroeder, Kang, Shimek and Herbert, 2007; Ray, Hocutt and Patterson, 2005) or virtual learning environments like *Second Life* (Cheong, Yun and Chollins, 2009; Santana, 2010). The use of online learning courses in an e-learning environment is also well documented (Gabriel, 2005; Jennings, Sutherlin and Counts, 2010; Ostashewski and Reid, 2011, 2010b; Powers, Ku and Mayes, 2011; Randall, 2010; Zhou, Varnhagen, Sears, Kasprzak and Shervey, 2007). While Olcese (2010) used a *Ning* platform to successfully extend her student teachers' classroom space for discussion; Lockyer, Dawson and Heathcote (2010) did not find that student teachers were able to maximize the benefits of an *Elgg* for learning.

These studies indicate varying levels of success in gaining student-teacher satisfaction and in promoting professional learning among participants. The studies show that the availability of communicative technologies in themselves do not guarantee success and Zhou et al. (2007) found that building an online learning community was difficult. In redesigning an online course to incorporate social media tools, Ostashewski and Reid (2010b, 2011) discovered decreasing participant feelings of isolation, greater sense of community among participants and increased satisfaction in professional learning.

2.1.5   Online Social networking Sites for in-service teachers

Anderson (2008b) indicated interest in exploring the benefits of networks for e-learning and suggested that the affordances of SNS like *Elgg* can have great educational value and increase the costs and learning benefits of distance education. A case study of a successful online environment for distributed teacher professionals called *Tapped-In* is described by Farooq et al. (2007). Also important is the study of *MirandaNet*, a SNS established in 1992 to support the lifelong learning of teachers and uses action research methodology as a means of empowering teachers using ICT in the classroom (Cuthell, 2002). These early studies show the potential of networked learning systems for enhanced connectivity and communication among like-minded individuals and an ease of sharing and accessing information expressed in a multi-media format as text, pictures/emoticons and video (Haythornwaithe and de Laat, 2010). In a recent study, Ray, Kalvaitis, Wheeler and Hirtle (2011) found that teachers enrolled in a Master of Education programme found both benefits and challenges to using social media for personal, academic (college, classes) and professional (teaching) use. They reported benefits of staying in touch with colleagues and friends and the enabling of collaborative environments but that social media was too time-consuming. The study did not indicate through what medium the participants were able to engage social media or how the research was related to the course of study.

Among the few studies that research the use of SNS for teacher professional development programmes for practicing teachers are the works of Thistleton-Martin and Lewis (2009) which addresses the use of Ning to create an online community of practice for beginning teachers in Australian primary schools and that of McPherson and Castellani (2008) who investigated the use of Ning to facilitate a cross-national project, Global Connections 2008, for pre-service and in-service educators in teacher preparation programs from the United States, Taiwan, China, Japan, and the United Kingdom. In earlier studies, Beam (2002) reported on the success of an Ontario Network of teachers called the Education

Network of Ontario that consists of more than 100000 teachers, administrators, trustees and education faculty today. This computer-mediated network offers email and discussion board facilities and affords teachers the opportunity to expand their connections across large geographic spaces where they exchange ideas and learn from one another, thus extending their learning in new ways.

In a very new and relevant study in Finland, Aarreniemi-Jokipelto (2011) used a collaborative learning environment using social media in addition to Moodle, a course management system, which focused on vocational teacher formal learning and had the features of formal and informal learning. Teachers had the freedom to choose social media tools and to create desired collaborative learning spaces for small groups. Also, Liu and Miller (2011) describe some success in using a SNS to facilitate continuing online professional development for teachers after graduation from Teacher College by facilitating an online community of learners. Finally, the ongoing design-based research work of Ostashewski and Reid (2010a) is significant as it provides teachers with an opportunity to access Professional Development using a courselet delivered within a social networking site. When comparisons with traditional online learning systems like Moodle are made, Brady, Holcomb and Smith (2010) suggest SNS cater to a greater degree of interaction amongst participants. They assert that this is due to the highly participatory nature of embedded Web 2.0 tools, thus establishing SNS as an enabling environment for teacher professional learning where teachers can exercise control over their learning, allow for the development of social relationships and experience first-hand how to use Web 2.0 tools (Ostashewski, Moisey and Reid, 2011).

These few studies suggest the need for more research into how social networking sites can support teachers' ongoing teachers professional development and to investigate the nature of interactions among participants. They provide an opportunity for me to contextualize an online social networking space, with embedded Web 2.0 tools, that allows for research into the ways that teachers make connections with colleagues of similar interests.

2.1.6 Summary

The literature reviewed indicates a number of potential educational affordances of Web 2.0 tools. I looked at the ways that Web 2.0 can impact the teaching/learning environment and how it allows for shifts in learner control and the creation of a social and participatory culture. There is a need to research on harnessing the affordances of Web 2.0 tools for

educative purposes and in education contexts. Potential educative affordances have been categorized by Light and Polin (2010) and Lee and McLoughlin (2008) and existing studies are new and non-definitive in approach in exploring these affordances to learners. In this section, I was able to distinguish among terms that are often used interchangeably such as social media, social networks and social networking sites. There is enormous scope to add to existing bodies of literature on how SNS can impact teachers' learning.

2.2   Part two-Learning in Online Social Networking Sites

This next part of the Literature Review takes a closer look at theories of teacher learning and how learning theories inform online social spaces. An examination of existing learning theories is undertaken to provide a background to issues and theories that are applicable to understanding teacher learning in online social networking sites. The literature suggests that informal learning/workplace learning and adult learning theories are important to professional learning concepts. Existing theories of online learning and social learning as well as newer theories like connectivist theory, collaborative theory and social network theory are examined for a theoretical framework for understanding learning on online social network sites.

2.2.1   From Teacher Professional Development to Teacher Professional Learning

Despite favorable research to support the potential and opportunities of technology-mediated learning environments (Bush and Hall, 2011; Davies and Merchant, 2009; Lee and McLoughlin, 2008; Selwyn, 2008, 2011), including providing learners with a collaborative and communicative platform that can engage students and teachers alike, my search through the literature suggests that their value is still under-researched for their role in teacher professional development. As teachers seek to engage students of today in authentic tasks, they draw on their own experiences with technology. But if they have little experience with these tools, they also face challenges in designing activities that use them. As such, a lack of confidence and competence is viewed as a significant barrier to teachers' effective use of Web 2.0 technologies.

Teachers require training and ongoing professional development in Web 2.0 uses that can influence their attitudes and beliefs towards technology as well as provide them with the knowledge and skills to employ technology in classroom practice (Hew and Brush, 2007). Generally, professional development programs on the whole are considered to be "not of high

quality, offering fragmented, intellectually superficial seminars" (Borko, 2004, p.3) which are "disconnected from the realities of classrooms" (Darling-Hammond et al., 2009). In particular, professional development programmes for teachers in using new and emerging technologies and changing pedagogies are critiqued for being ineffective (Ertmer and Ottenbreit-Leftwich, 2010; Hew and Brush, 2007; Lawless and Pellegrino, 2007; Santana, 2010; Zhou et al., 2007). They are found to be deficient in several ways, in particular, the quality, sustainability, cost, time for teachers to learn, decontextualized learning experiences, lack of mentoring and opportunities to work together and do reflection (Dede et al., 2009; Lawless and Pellegrino, 2007; Levin and Wadmany, 2008; Ostashewski and Reid, 2010).

The literature reveals a problem of teachers' classrooms being off-limits to their colleagues and this disadvantages them from learning from one another (Darling-Hammond et al., 2009; Lieberman and Mace, 2008, 2010) while teaching, especially in large secondary schools. Teachers have little opportunity to seek knowledge or support for individual endeavors from colleagues and are given little chance to work collaboratively either through observation or research or team-teaching which can lead to teacher isolation (Zhou et al., 2007). Troubling problems in teacher professional development persist as Lieberman (1995, p.75) laments, "teacher development has been limited by a lack of knowledge of how teachers learn". Lieberman and Mace (2010, p. 78) suggest further, "it has been only quite recently that researchers and policy makers have recognized that our current mode of providing professional development for teachers needs radical change".

The idea that teaching is a learning profession (Darling-Hammond et al., 2009) engages a substantial body of literature and researchers distinguish between the concepts of professional development and professional learning. Recently, newer, more complex and broad-based ways of looking at teachers' learning have emerged over observations of 'discrete' activities like workshops and seminars (Desimone, 2009). These investigations stem from an idea from research that teachers' participation in professional development workshops do not appear to result in learning. These workshops are stand-alone and are unable to provide ongoing support for teachers as they try new strategies in the classroom, and this may be exacerbated in an uncaring school environment (Dede et al., 2009). Bruce, Esmonde, Ross, Dookie and Beatty (2010, p.1599), propose that in professional learning, "professionals learn from experience and that learning is ongoing through active engagement in practice".

Desimone (2009) asserts that the most difficult part of teacher professional development to measure is teacher learning, however, she argues for more appropriate ways of measuring teacher knowledge change and proposes that recent research in the field has allowed a conceptual framework for teacher learning to emerge and should be used without bias. Research on teacher learning includes that of teacher education and professional development and also what is learnt from informal interactions with colleagues and daily classroom practice (Feiman-Nemser, 2008; Vermunt and Endedijk, 2010). Moving from formal settings for professional development to teachers' informal interactions that take place in a workplace context as teachers engage in their daily practice has spawned researchers to examine how learning can take place in informal settings (Borko, 2004; Opfer and Pedder, 2011).

2.2.2   Teacher Learning

Wenger (1998, p.214) describes learning as an "interaction between experience and competence, which must remain in a state of tension for learning to occur" and that learning is not designed but emerges through an incidental outcome of member's interactions. In Lave and Wenger's (1991, p. 53) Community of Practice, (COPs), learning involves a person becoming a full member of the community and learning 'only partly, and often incidentally, involves becoming able to take part in new activities… and master new understandings'. Where learning in practice resembles an apprentice-learning system enables the idea that becoming a member of a community and becoming skillful are part of the same process". Cuddapah and Clayton (2011) support this idea and argue that teaching is composed of many such practices where performance of new entrants is expected to mirror that of more experienced colleagues and that through participation in communities of practice, meaning is made through identity-formation and learning takes place.

Penuel, Riel, Krause and Frank (2009) argue that analyzing teachers' interactions from a COP perspective necessarily must focus their efforts on understanding a subset of collegial interactions in a school, such as informal interactions among cliques in lunchrooms and hallways. These authors further suggest that research into the distribution of leadership practices across people, tools, and situations do tend to acknowledge the network structure of interactions, but their work tends not to consider the role of informal subgroups of teachers in mediating access to valuable resources and expertise. Borko (2004) argues that fostering discussions around practice is not easy and suggest that trust and respect among members is important as well as a need to look at communication and participation patterns.

Research into teacher learning is not as well developed as that of student learning (Vermunt and Endedijk, 2010) and a number of researchers suggest the need to study it within multiple contexts such as in the workplace (Eraut, 2004) and through different lenses (Borko, 2004; Desimone, 2009; Lawless and Pelligrino, 2009; Opfer and Pedder, 2011; Vermunt and Endedijk, 2010). Borko (2004, p.4) suggests that teacher learning needs to be studied taking into account "both the individual teacher-learners and the social systems in which they are participants" while Vermunt and Endedijk (2010) conducted empirical research into models of patterns in teacher learning and found that teacher-learning patterns were directly related to both personal (personality characteristics, personal experience in teaching and learning and gender) and contextual factors. These authors suggest that the most direct factor in teacher learning is the learning environment. For in-service teachers, the learning environment includes the social environment (fellow teachers and students), the type of intervention used (such as peer coaching, informal learning, collaboration) as well as the wider school climate (in terms of openness to innovation); (Vermunt and Endedijk, 2010, p. 298).

Opfer and Pedder (2011), in their review of literature on teacher learning also identified the role of the learning activity (or process) as important as that of school factors and individual teacher characteristics. They used a complexity theory lens to study the interrelations among factors in teacher learning and critiqued the linearity and discreteness of other approaches to studying teacher learning. In a longitudinal study of secondary school teacher learning at their workplace (schools), Bakkenes, Vermunt and Wubbels (2010) adopt a definition of teacher learning as

> "an active process in which teachers engage in activities that lead to a change in knowledge and beliefs (cognition) and/or teaching practices (behaviour)" (p.538).

In analyzing digital logs of teacher learning experiences, these authors distinguished between learning activities (experimenting, considering own practice, getting ideas from others, experiencing friction, struggling not to revert to old ways, and avoiding learning) and learning outcomes (changes in cognition and behavior) (Bakkenes et al., 2010, p. 538). They describe learning activities as the thinking activities learners use and conclude that

> "In principle, every activity can lead to a change in knowledge, beliefs or practices. Therefore, every activity can be a learning activity, even when a teacher did not have the intention to learn from that activity" (Bakkenes, Vermunt and Wubbels, 2010, p. 536)

Although research is still inconclusive about the impact of individual or collective factors in teacher learning, there is agreement that teacher professional learning represents an important, but "subtle" shift in how we perceive professional education and professional development of teachers (Feiman-Nemser, 2008, p.697). I conclude that the way that student learning is measured, as scores in tests and exams, is inappropriate in measuring teacher learning and that literature on workplace learning and informal learning can provide a useful lens for framing teacher learning (Hoekstra and Korthagen, 2011), especially if participation in activities can lead to desirable learning outcomes.

2.2.3 Perspectives on Theories of Learning that Impact Teacher Learning

Learning theories refer to ideas about how the complex process of learning takes place. These theories have been largely influenced by how children learn, especially in school settings but may be inadequate to describe how teachers learn, both in formal and informal settings. I therefore examine the role of informal learning and workplace learning for their value in teacher learning. Focusing on the teacher as a learner also enables me to place a lens on adult learning as teachers are perceived as adult learners.

2.2.3.1 Informal Learning versus Systematically Supported Learning

Teachers who have entered the profession may have completed pre-service or possibly in-service training but may not have had the time or resources to avail themselves of further professional development opportunities. Teachers assert that they learn by doing or by trial and error at school and this may be described as informal learning. This is different from what is commonly understood as professional development for teachers and is accompanied with a shift of emphasis to reflection on practice. Much of this learning is experimental (Van Eekelen, Vermunt and Boshuizen, 2006) and experiential (Itin, 1999). Informal learning may be described as "learning where no Professional Development trajectory or learning community has been explicitly organized to foster teacher learning" (Hoekstra and Korthagen, 2011, p. 76). Hence much of a teacher's professional learning takes place at the workplace informally.

Advocates for informal learning suggest a change in structure for learning and that schools lack the infrastructure to support workplace learning (Kwakman, 2003) and conventional models of learning may need to be de-emphasized for more emergent forms of learning (McGuire and Gubbins, 2010). Research also shows that teachers are motivated to learn differently across their professional careers (Vermunt and Endedijk, 2010) and that learning

might take place individually or collaboratively, intentionally or unintentionally (Jokisalo and Riu, 2009). Given the availability and ease of social media, "there is growing evidence that many people are engaged in a wide range of technology-based informal learning at home and the community" (Selwyn, 2007, p.2). This implies that informal learning can happen anywhere, anytime and can benefit teachers through a multiplicity of learning pathways.

However, learner-centered approaches may often be considered as "messy endeavors" (Weimer, 2002 in McGuire and Gubbins, 2010, p. 254), whereby learners can often feel "stranded, disoriented, disconcerted, and threatened by the ambiguity and constant renegotiation of the learning process". It has been reported that teachers do not avail themselves of professional learning opportunities at school (Kwakman, 2003) but reasons are not clear for this lack of professional reflection at work. Research indicates that informal learning assumes certain learner skills and does not supply necessary tools for learning and support that formal learning provides (McGuire and Gubbins, 2010). In a recent study where teachers were encouraged to foster active and self-regulated learning in a context of community and social learning where the study required teachers to change their philosophies and strategies; Hoekstra, Brekelmans, Beijaard and Korthagen (2009) did not generally find that teachers made a shift even though they engaged in informal learning and suggest that perhaps there was a need to adopt Dewey's (1938) view that they should "discriminate between experiences that are worthwhile educationally and those that are not". Hoekstra et al., (2009) developed a model to explain layers of change in learning, called the 'onion' model, and found that change occurred at outer layers such as the environment or their practice but not at the core, where beliefs were centred. Svensson, Ellstrom, and Aberg (2004 in McGuire and Gubbins, 2010, p. 254) argue that while "informal learning is important, it is not sufficient for the acquisition of knowledge" and "needs to be supported by formal learning".

Formal learning opportunities such as workshops and seminars are not always available when teachers want them or in a format that they seek. Informal learning, especially enabled by technology, allows for teachers to take charge of their learning and cater for tacit learning. The ability to draw from locally available expertise can also advantage teachers. However, it is well known that schools are cultural establishments that mirror socio-economic structures and informal learning places emphasis on individuals taking charge of their learning. Research on informal learning needs to pay attention to the tensions between freedom from power and control and structure to inequity inherent in a pedagogy that could privilege

certain identities over others, mirroring broader social and political inequities (McGuire and Gubbins, 2010).

2.2.3.2 Teachers as Adult Learners

The literature on adult learning reveals a range of divergent views and opinions and my research does not reveal one single complete theory on which to base my study. Initial work on understanding adult learning is credited to Knowles who developed the concept of andragogy, which is built on principles of pedagogy applicable to any adult learning situation. Knowles (1990 in Knowles, Holton and Swanson, 2005, p. 57) created a set of assumptions about how adults learn which he used to develop educational programs for adults. The six assumptions of andragogy are that adults are autonomous, self-directed learners, they need to know why they are learning, they bring a wealth of experience to the educational setting, they enter educational settings ready to learn, they are problem- centered in their learning, and they are best motivated by internal factors.

There is ongoing criticism of Knowles' work as a theory (Blondy, 2007) and whether or not these assumptions are true only for adults (Merriam, 2002). Although Knowles first viewed andragogy as being a separate entity from pedagogy, he revised his views over time and stated the viewpoint of andragogy and pedagogy as being on a continuum, noting that there were times when either approach might be appropriate based on circumstances and needs of the particular learner (Knowles, 1990). Knowles' work has elements of constructivism such as self-direction and problem-centred learning; as well as that of motivation as his concept of adult learning suggests that as learners grow and mature, they become more and more capable of being self-directed and wise due to their experiences and past knowledge. Blondy (2007) concludes that Knowles' work is applicable to online learning environments and that his assumptions can help educators to create a more learner-centred approach to online education.

Several other theories are important to adult learning such as Mezirow's (1991) transformative learning and Kolb's (1984) experiential learning. While these theories have different emphases, they are founded on a common principle that adults are independent learners who are capable of taking control of their lives and learning. While working on adult learning theory, Knowles had begun work on a related concept of self-directed learning. Transformational learning has gained importance in adult education as it focuses on deep level of changes in a learner such as values, beliefs and actions. Individuals are critically

aware of their own assumptions and focus is on critical reflection of one's practice. Deep transformative learning can occur within a community when the right environmental factors are present to establish a strong sense of community (Ryman, Burrell, Hardham, Richardson and Ross, 2010).

2.2.3.3 Self-Directed Learning and Motivation

According to these theories of adult learning, motivation to learn emerges as a critical theme. Adults may be motivated either by external factors such as job mobility and performance appraisal or internal factors such as job satisfaction and self-esteem, but the latter has a stronger pull (Knowles, 1990). Motivation according to Maslow (1954) involves satisfying a person's needs and wants. It can be argued that teachers participate in a learning environment to satisfy needs of competence, self-determination, and connectedness (Deci, 1980).

In examining key constructs within the context of achievement motivation, Auld, Blumberg and Clayton (2010) found goal-orientation and self-regulated learning to be significant. Those who are considered highly self-regulated are knowledgeable about their abilities and how to attain their goals and are also likely to demonstrate high levels of self-efficacy. Those considered weak self-regulators are often less likely than high self-regulators to sustain effort to attain their learning objectives and often select tasks that require little effort to succeed and pose little to no challenge.

Another significant theme in adult learning theory is that of self-directed learning which refers to a concept in adults that is characterized by independence of thought and action (Knowles, 1990). Educational debates continue about the level of significance of personal characteristics like self-direction and motivational interest in teachers' participation in professional learning activities.

2.2.3.4 Teacher Professional identity

How teachers perceive themselves professionally informs their practice and how they participate in professional development (Feiman-Nemser, 2008). Developing a professional teacher identity at the beginning of a career and reflecting on it is an ongoing process as teacher identity is multi-faceted and shifting (Rodgers and Sullivan, 2008 in Feiman-Nemser, 2008, p.701). This takes place by engaging in dialog with significant people including peers and mentors (Hoekstra and Korthagen, 2011). Professional teacher identity involves how teachers see themselves as teachers and how they think others perceive their roles as

professional (Balatti, Knight, Haase and Henderson, 2010). Learning occurs through interacting and "interactions are the engine room of identity" (Falk and Balatti, 2003 in Balatti et al., 2010, p. 184). As teachers construct an image of themselves, they form a professional identity, which influences their practice by emphasizing certain tasks over others and in making decisions about their own learning.

2.2.3.5 Online Networks for Teacher Learning

New directions in teacher learning have been suggested to meet some of the challenges that teachers currently face in professional development. Lieberman and Mace (2010, p. 86) propose a vision for professional learning initiatives that are "democratic, participatory, and inexpensive". These learning initiatives should fit in with teachers' busy schedules and provide for real-time, ongoing, work-embedded support (Dede, et al., 2009). Current research on teachers' professional learning, including online environments, suggests that evaluations of outcomes be framed around "core features," including "content focus, active learning, coherence, duration, and collective participation" (Desimone, 2009, p. 183). Teachers can also benefit from sustained professional learning programs that are collaborative (Bruce et al., 2010) and the use of networked teacher communities are suggested (Lieberman and Mace, 2010; Lieberman, 1999; Whitehouse, 2011). While teacher networks are not new, online teacher networks are less prevalent. Collaboration among teachers across schools can encourage discussion and deepen teachers' thinking of the complexities of teaching and continued focus on teachers' work builds a culture of participation, foregrounds the importance of the nature of teaching, and highlights collaboration with one's peers as a continued part of improving one's practice ((Lieberman and Mace, 2010, p.79).

Lieberman and Mace (2010) make strong arguments for teachers to go public with their work and suggest that this not only enhances their practice but also that of others. Online spaces can allow for connections to be made with "like-minded colleagues" (ibid, p. 233) and allow geographically dispersed members to meet, exchange ideas, and learn from each other. On online networked spaces, teachers can interact with each other in multiple and multimodal ways, leading to a model for collaborating, communicating and participating that could transform the way they learn. Learners can create and share their own knowledge products, build communities, and flex their creativity in a safe environment enabling them to be producers of knowledge (Merchant, 2006) instead of being just passive recipients in their learning, which leads the way for teachers to take greater control of their learning (Borko,

Whitcomb and Liston, 2009). Online social networking sites can be viewed as powerful as they facilitate democratization of content through *tagging* and *folksonomies* (Lockyer, Dawson and Heathcote, 2010) and harness the powers of quick and multiple connectivity through Web 2.0 tools.

2.2.3.6 Summary

Traditional approaches to professional development have been critiqued for being ineffective in meeting the needs of today's teachers. The need for teachers to be engaged in learning even while engaged in practice has been articulated by research and the rise of Web 2.0 technology has pushed teachers to reconsider how they can gain control of their learning. In examining the literature on teacher learning, I have looked at major learning paradigms applicable to adults and children alike. In using Lawler's (2003) argument regarding teachers as adult learners, I have taken a closer look at themes in adult learning theories such as adults are self-directed learners, and that internal motivation guides the adult to success. Learning with others and through their interactions help to shape a teacher's professional identity which influences their practice. The concept of teachers learning informally inside and outside of their workplace provides a context for non-traditional learning spaces like online social networks to be considered. These networks can be powerful if they allow teachers to be connected to each other and enable real-time and ongoing support.

2.2.4   Learning Theories associated with Online Social Network Sites

This section considers a review of current theories related to learning through Web 2.0 tools in an online-networked environment. When directed at learning, Web 2.0 impacts on four principal dimensions of the learner's experience of which two are broadly social in nature (collaboration and publication) and two are more cognitive (literacies and inquiry) (Selwyn, 2008, p. 9). This categorization enables me to frame my research on learning on online social networking sites under two major theoretical perspectives: social learning theory and online learning theory, which examine cognitive aspects of learning on the web. It has been argued that conventional theories of behaviorism, cognitivism and constructivism were designed at time when it was inconceivable for learners of diverse backgrounds, races and geography to participate in the same learning space (Siemens, 2004,2005). Thus, there is a need to look at theories supported by both online and social learning that can provide me with suitable lenses to explore the dynamics of participation and learning in connected virtual spaces.

2.2.4.1 Social learning

Social Learning theory (Bandura, 1977) is often seen as a bridge between behaviorist and cognitivist theories because it explains human behavior between cognitive, behavioral and environmental influences. Social learning theory proposed that individuals learn by observing the actions of others and the consequences of those actions, and by imitating behaviours that appear to generate positive outcomes. Bandura (1977) emphasized the importance of educators being able to understand their students' own beliefs about their ability as learners. Bandura also stressed that individuals learn through observing others. It is where individuals learn attitudes, beliefs and behaviors. Cognitive and constructivist perspectives of adult learning emphasize the importance of understanding the process of learning from the learner's perspective. The most important dynamic lies in the process of cognitive mediation where individuals construct cognitive models of social awareness and reality based on their social experiences in order to guide their decision-making and thinking about social behavior. They learn possible actions and their probable consequences.

Constructivist theorists claim that learners interpret the world according to their personal reality and that learning takes place based upon prior knowledge and experiences (Ally, 2008). The constructivist approach is based on ideas developed by educational philosophers, such as Dewey (1910), and renowned educational psychologists, such as Vygotsky (1978), Bruner (1973), and Piaget, and educational technology visionaries, such as Papert (1980). Individuals understand themselves and the world around them by constructing personal and tentative theories and models that serve as guides to predict and control events and so, new experiences may lead to changes in the individual's perspective. Educators design activities that guide learning so that learners can construct new meanings from prior knowledge.

Theories of social development which promote social interaction for learning and Lave and Wenger's (1991) situated learning theories are important for examination of how teachers can learn both in and out of school in informal spaces such as in school corridors, lunch rooms and even at home. Vygotsky's (1978) 'zone of proximal development' helps to explain that learning takes place at work in formal and informal settings by novices observing more advanced learners and can apply that to practice almost immediately. The success of learning in such an environment is predicated on trust, that is, trust of the learning space, trust of the knowledge transmitted and trust of the participants themselves (Usoro, Sharratt, Tsui and Shekhar, 2007; Dron, 2009). The enabling facility of Web 2.0, in learning communities that support and expand social learning, aids our understanding of "content (that) is socially

constructed through conversations about that content and through grounded interactions, especially with others, around problems or actions" (Brown and Adler, 2008, p.3). The focus is not so much on what teachers are learning but on how they are learning.

Borko (2004) describes the term *situative* as a set of theoretical perspectives and lines of research with roots in various disciplines including anthropology, sociology, and psychology. She describes *situative* theorists (e.g. Greeno, 2003; Lave & Wenger, 1991) as "conceptualizing learning as changes in participation in socially organized activities, and individuals' use of knowledge as an aspect of their participation in social practices" (Borko, 2004, p. 4). In looking at recurring themes in the literature on situated learning, teacher learning "is usefully understood as a process of increasing participation in the practice of teaching, and through this participation, a process of becoming knowledgeable in and about teaching" (Adler, 2000 in Borko, 2004, p.4).

Researchers like Dede (2005) have looked at the way that learning can be changed in spaces that embed emerging technologies. He acknowledges that situated learning has not been fully utilized in educational settings as much as behaviorism or cognitivism has, because "creating tacit relatively unstructured learning in complex real-world settings is difficult" (Dede, 2005, p. 15.4). The role of knowledge transfer in situated learning is critical and knowledge-sharing and learning is intertwined in the context in which they occur. The epistemology underlying situated cognition is that learning entails the process of doing (Boyle, 2008) so learning takes place by interactions not just with content but also with other people in real or 'authentic' situations. Authentic activities are the focus of situated cognition theory, which may be described as "activities that are similar to what practioners do" (Brown et. al, 1989 in Putnam and Borko, 2000, p.4). There are three conceptual themes that are central to the situative perspective: cognition that is situated, social and distributed, all of which provide suitable lenses for further exploration of teacher learning (Putnam and Borko, 2000).

Online professional learning communities have been embraced by educational researchers like Lieberman and Mace (2010), who suggest that social learning principles lie at the core of teachers' learning. The idea of learning community can be applied to teachers, who as participants in a community, take on particular roles and responsibilities within it and use available resources to reproduce, improve, or even transform practice (Cuddapah and Clayton, 2011; Lieberman and Mace, 2008; Zhou et al, 2007). Wenger, McDermott, & Snyder (2002, p. 4) describe a learning community as "a group of people who share a

concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis". This professional knowledge becomes the property of the community and "such participation shapes not only what we do, but also who we are and how we interpret what we do"(Wenger, 1998, p. 4).

Gunawardena et al. (2009) argue for using a COP perspective for SNS and suggest that informal interactions can lead to learning in a shared social space where members benefit from knowledge that is "created, shared, organized, revised, and passed on within and among these communities" (Wenger, 1998, p.24). When collaborating using Web 2.0 technologies, participants adapt to using new and available Web 2.0 tools and they will do so either in ways that reveal native cultural values, or reflect the creation of new cultural norms and conventions (Gunawardena et al., 2009). While these research studies offer clues about teacher interactions with each other and the ways they engage with artifacts and representations of teaching (Little, 2002, 2003), they are limited in analyzing informal interactions.

Newer influences on Lave and Wenger's social theory of learning are emerging for online teacher professional development. Mackey and Evans (2011) reveal a tension in describing teachers' dual participation in professional (school) and online communities (from participation in an online course) and extend Wenger's social learning theory in a bid to understand the intersections of teachers' informal learning with formal online learning opportunities, and authentic learning in communities of practice. These authors propose the use of connectivist theory as enabled by e-learning and virtual learning environments, as examples of connectivist pedagogies in action as a more suitable lens to view how teachers, as working professionals, connect with their peers in other schools as well as in their own. Their research on teacher online professional development supports Siemens (2005) connectivist theory where

> "Personal knowledge is comprised of a network, which feeds into organizations and institutions, which in turn feed back into the network, and then continue to provide learning to [the] individual. This cycle of knowledge development (personal to network to organization) allows learners to remain current in their field through the connections they have formed" (Mackey and Evans, 2011, p. 12).

This network of connections enables interactions among participants and can lead to learning (Dron and Anderson, 2007; boyd and Ellison, 2007). Lieberman and Mace (2010) discuss the potential of networked technologies and communities to make teaching practice public and

the transformative power of sharing teachers' knowledge. They highlight the value and impact of online connections and claim, "from more formal networks designed with particular purposes to informal grassroots connections, teacher professional learning is thriving online" (p. 86). Networked interactions allow teachers to share their own practice, rather than being the passive recipients of expert knowledge; such interactions provide opportunities for useful discourse related to practice.

Social networking tools mediate between the knowledge of the individual and their contribution to knowledge building within a COP (Gunawardena et al., 2009). This type of learning supports that of the individual as well as the group as a whole, minimizing differences in learner participation. Laferrière, Lamon, and Chan (2006, p.78) similarly note that such technologies enable distributed cognition whereby teachers "create and improve knowledge of the community collectively". There seems to be association between networks and communities but there is still debate about the suitability of a COP model for examining teachers' informal learning on a SNS.

2.2.4.2 Online learning

Online learning, evolved from early concepts of distance education and e-learning, generally referencing learning associated with participation in online courses. The complex individual and social nature of online learning has been well researched and documented in recent years (Conrad, 2009) as well as potential benefits for learners. A key feature of online learning is the distribution of participants and facilitator across space and time, thus allowing participants from diverse backgrounds and competency levels to learn together. A significant advantage to learners is the freedom to participate either in real-time or delayed (Anderson, 2008a). Research has shown that fostering a sense of community among online participants has led to greater success and student satisfaction (Anderson, 2006; Brady, Holcomb and Smith, 2010).

Garrison, Anderson and Archer's (2000) Community of Inquiry model has been significant in providing insights and methodological solutions for studying online learning research (Garrison, 2007). This framework consisted of three elements—social, teaching and cognitive presence—as well as categories and indicators to define each of the presences. Its genesis is in the work of John Dewey and is consistent with constructivist approaches to learning in higher education. Elements of social and cognitive presence in online education among students included expression, exploration, reflection and collaboration. Studies using this

model saw differences in each types of presence and explored the role of the teacher in the design of the course and in facilitating discussions and directing instruction.

Online spaces that allow teachers to come together with shared interests can enable meaningful interactions among participants and the concept of online learning community is being proposed as one that "is supported by the growing culture of participation in the learning activities through the interactional process" (Dias, 2001 in Camacho and Gisbert, 2006, p.1099). It also takes into consideration the existence of a common goal and the possibility of reflection on practice. "From this departing point, a learning community develops itself when all the participants are deeply involved in the process of knowledge building, first as mutual engagement on community formation and after on the development of learning activities"(Camacho and Gisbert, 2006). On-line learning communities, thus, promote a culture of sharing in which collaboration and interaction become essential (Davies, 2006). Online communities thrive on knowledge-sharing among participants regardless of country, race or culture (Liu and Miller, 2011) and this lies at the core of teachers' continuous professional development (Hew and Hara, 2007), which can be both formal and informal. Network communities are a form of technology-mediated environment that foster a sense of community among users.

So far, the literature on online learning has been contextualized by the design and delivery of online learning courses for students in higher education but frameworks for understanding online learning in other spaces such as online networks are deficient (Liu and Miller, 2011). Dron (2006, 2007) in Dron and Anderson, 2007, p. 2460) critiqued studies on social software for "lacking distinct theoretical foundations" by drawing on work on Computer-Mediated Communications which emphasize "intentional collaborative practices which fail to recognize the emergent entity formed by the bottom-up, individual interactions of the many". This gap has led to studies that explore learning in online spaces in different ways. Davies (2006) describes learning in a space enabled by the photo-sharing tool Flickr as a 'Third Space' which allowed users in multiple contexts to share new ideas and "bring cultural understandings together with others, where they can be re-examined, used and transformed in the image-making practices of others" (p. 18). Studies on network-mediated collaborative learning suggest another approach to learning on SNS (Harasim, 1999). As interest in technology-mediated professional development grows, models emerge to meet the needs of teacher learners with a view to design programmes that are "intensive, ongoing, and connected to practice" (Darling-Hammond et al., 2009, p.10).

Anderson (2008a, p.48) argues that the online learning environment is a unique cultural context in itself and cites Benedikt (1991) that cyberspace "has a geography, a physics, a nature and a rule of human law". The loss of physical space leads to the development of an online identity, which is an important perspective in understanding online learning. Wenger describes identity formation as a work in progress influenced by participation in learning over time. The situated and social nature of learning has had an impact on research literature and thus there is an increased use of communities and communities of practice in professional learning for teachers. There has been a move towards adopting a constructivist approach to learning on the Web. Social constructivism recognized the social nature of knowledge and how it is created in interactions among participants. Vygotsky's (1978) 'Zone of Proximal Development' is central to this theory, which allows for the difference between an individual learner's achievement while working on his or her own and the potential extent of their achievement with the assistance of more able peers or tutors. Learners need to be active participants in the teaching/learning environment and be given the opportunity to create new products and experiences through scaffolding activities that rely upon past knowledge. Adopting social constructivist principles allows a facilitator of online learning to use strategies like collaborative learning and situated learning where skills and knowledge can be applied in specific contexts (Ally, 2008).

The concepts of online learning communities and virtual learning spaces have both been found in the literature but are complicated by the use of networked digital devices. The concept of virtual spaces is described as "any location that people meet using networked digital devices" (Brown, 2005, p. 12.3) and which are enabled by both asynchronous and synchronous Web 2.0 tools. They can be spontaneous as well as deliberate and participants can shift how and with whom they interact as they please. Virtual learning spaces that facilitate training for teachers are desirable especially if they "enable teachers to implement successfully ICT in their teaching practices" (Camacho-Gisbert, 2006, p.2). Online learning spaces can facilitate teachers' voices, especially for those marginalized in face-to-face settings (Dede, 2007). They can also give learners the benefits of control over time and space through the affordances of combined asynchronous and synchronous tools. These learning spaces can enable learning in self-directed ways and allows the learner to select content of choice.

Cole & Engeström (1993)'s activity theory allow us to study the nature of interactions in computer-mediated networks inspired by socio-cultural perspectives. Cole and Engeström's

theoretical model suggests a dynamic categorization of a number of dimensions to be found in activity: a subject, an object, a community, a mediating artifact, rules, and division of labor (Conole, Galley and Culver, 2011). Dron and Anderson (2007) describe three entities involved in activities supported through the use of social software: the group, the network and the collective, which are useful in selection of Web 2.0 tools for the purpose of harnessing its particular affordance for learning. Groups might be described as a social entity with shared interests and intentions; networks are more fluid as they allow for members entering and exiting at will and may choose to participate as they wish. Collectives consist of individuals whose networked activities are harvested to generate 'wisdom of crowds'. The usefulness of this lens is the suggestion that Web 2.0 tools that promote knowledge creation such as real-time and short-term asynchronous tools are well suited to networks (Dron and Anderson, 2007,p.5).

From a socio-cultural perspective, understanding how online learning occurs involves an appreciation of how learners participate in selected activities and tasks, how they harness the affordances of Web 2.0 tools in the online space and how they practice, how they use and value discussions and interactions among themselves. Silverman (2011) looked for relationships between online interactions and teacher learning through evaluating the content of posts and individuals in interactions among them and found that generally, interaction was not correlated with teacher learning, but that particular combinations of content and the centrality of an individual in the interaction were. Web 2.0 tools have redefined the meaning of learning space by challenging traditional idea that place and times are fixed. The structure and content of learning can be formally scheduled or it can be accessed according to the desires of the learner.

Collaborative learning is a very new concept based on emerging Web 2.0 technologies that facilitate real-time collaboration among participants. Aarreniemi-Jokipelto (2011) contends that collaborative learning is not just a tool, but it is also a concept, created by a small group with the help of social media tools. The collaborative learning space refers to a virtual space that is organized, customized and shaped by learners who have the liberty to choose the tools they wish to use. Web 2.0 enables collaborative learning through tools that allow for multiple authoring in the same space like Google docs, chat rooms, virtual whiteboards or wikis (Sung, 2010). Lieberman and Mace (2010) discuss the potential of online-networked technologies and communities to make teaching practice 'public' and the transformative power of sharing teachers' knowledge on a medium that is "democratic, participatory and

cheap" (p.86). They highlight the value and impact of online connections and claim, "from more formal networks designed with particular purposes to informal grassroots connections, teacher professional learning is thriving online" (Lieberman and Mace, 2010, p. 86). Networked interactions allow teachers to share their own practice, rather than being the passive recipients of expert knowledge; such interactions provide opportunities for useful discourse related to practice. It is precisely this ability of Web technologies to make conversations about practice easier, more open and available to other colleagues that can enable teachers' informal learning in ways that have not been explored before. Preece and Schneiderman (2009) propose that sociability is an important ingredient for online communities as it expands on social interactions among participants.

Research on online learning does not reveal a robust theory (Anderson, 2008a) but seems to offer varied approaches to understanding how people can learn online. Most current theories on online learning have had a genesis in distance education and online courses. The idea of building community in online learning environments has had considerable support from researchers. Focusing on cognition as constructed, situated and distributed can allow for understanding different facets of online learning. My research on theories of online learning in a networked environment seems to support the following: active and collaborative learning as well as the opportunity for learners to construct their knowledge in authentic settings (Ally, 2008). Ultimately, the facility of online learning for flexibility of time and space and learner control must continue to be valued.

2.2.5 Learning on Online Social Network Sites

The emergence of constructivism and situated learning theories has led to a shift to examining learning rather than teaching. It allows for analysis of formal learning and to consider the impact of informal learning in teachers' daily lives. If professional learning is considered in non-traditional spaces such as lunchrooms, homes and cafes, then it allows me to deliberate on online, networked spaces that allow flexibility in learning for teachers. I have looked at a number of theories related to both online learning and social learning and the impact of the Web on informal learning, but like other researchers (Merchant, 2009), I still have not found a theory that describes learning in a technology-mediated space like an online social network site.

Researching teachers' participation in online spaces allows me to examine tensions and commonalities between online learning theory and social learning theory. Web 2.0 tools and

SNS can allow participants to explore learning in a social environment. Lee and McLoughlin (2008, p. 3826) advise that the use of Web 2.0 tools to enable teaching/learning "must be underpinned by an explicit learning paradigm". In searching for a conceptual framework to understand participation in a networked space, I will rely on prevailing research trends using a socio-constructivist framework. Central themes in this framework revolve around that of participation, identity and practice (in communities or networks of practice) (Brown and Duguid, 2001), and the dynamics between them.

Online and social learning theories together help to inform how learning is situated and constructed on an SNS, but theories that emphasize connected and distributed learning across space and time, also seem important to framing learning on SNS. The literature speaks to the role of interactions among members in a shared space and the idea that participation involves interaction. Research on analyzing teacher interactions has been contextualized in an online course scenario, using a COP model (Gunawaradena et al., 2009; Lieberman and Mace, 2010) and where building community is critical to success. As such, online theories have been limited to communities in bounded systems and are problematic to scenarios like SNS where boundaries "between personal, social spaces and formal learning contexts" are blurred (Hall, 2009, p. 29). Participation is viewed as central to learning and social interactions are important to learning. Learning as a social and participatory practice is favoured to ideas of individualised learning.

In gaining an understanding of what learning on a SNS can be I have found that participation is linked to learning but is described in different ways depending on the way that the space is conceptualized. Lave and Wenger's (1991) concept of social learning had added value to my understanding as it allows for informal learning in a community. Davies (2006) describes learning as participant interactions and sharing of social discourses, which entail reflection on their existing experiences. Artifacts of learning on a *Flickr* SNS contain images, comments and views, sources from the everyday, off-line experiences of these members. Davies (2006, p. 219) describes this space as being in "a state of both constant affirmation and renewal, for contributions can be seen to both sustain the existing values as well as develop them". She does not describe the space in terms of community but draws upon Gee's (2004) ideas of affinity spaces and Bhaba's (1990) Third space to describe learning as easy and enabled through interactions among members.

Research on affordances of Web 2.0 tools embedded in an SNS suggests that social affordances are important to learning. Selwyn (2008, p.18) suggests that the "conversational, collaborative and communal qualities of social networking services are felt to mirror much of what we know to be good models of learning, in that they are collaborative and encourage active participatory role for users". These three qualities allow me to suggest that learning is possible on SNS. Selwyn (2008, p.10) describes Web 2.0 activities in terms of four human dispositions: the playful, the expressive, the reflective and the exploratory and suggests that learning can take place through socializing these dispositions. The learning potential of SNS is enhanced by multi-way communication, which is enabled by the marriage of benefits of groups, networks and collectives (Dron and Anderson, 2007, p. 2466). Further, online learning spaces such as SNS seem to have characteristics that allow for a shift from individual to collaborative learning, opportunities for peer learning and a move towards learner-centred approaches where the learner can exercise fuller control and responsibility of his/her learning. As such, virtual learning environments like SNS that are resource-rich and Web 2.0 enabled can be suitable for what Brown and Adler (2008) term learning 2.0.

The constraints to Web 2.0 technology are the conditions and relationships amongst attributes, which guide the use of the tool (Greeno, 1998). Research suggests that learning evolves as participants change the ways they interact on the site and that participation is fluid and dynamic (de Laat, Lally, Lipponen, and Simons, 2007; Khoo and Forrett, 2011). If a participant engages fully at a certain time or period of time, it can be interpreted as active learning. These characteristics are all supported in a socio-constructivist framework and as such, allows me to conclude that social-constructivism with an emphasis on situated learning approaches is appropriate for the way learning can happen on my SNS.

The emergent type of learning that can take place on a SNS is difficult to define and measure. The applicability of existing models is further complicated by the multiplicity of pathways of participation and interaction among participants that is possible on an SNS. The uniqueness of this space in terms of geography and culture (Anderson, 2008a, p.48), allow for emerging models to examine learning on spaces like these. It leads me to consider some of the main ideas found in the literature related to online learning and social learning in a networked environment, which in turn, collectively describes learning in online social networks. I have focused on the concept of learning in terms of participation (Lave and Wenger, 1991, p. 49) that "focuses attention on ways in which it is an evolving, continuously renewed set of relations...". I have also used ideas from Davies and Merchant (2009, p. 121) who have

suggested that participation in embedded web 2.0 tools generates content on the site and "allows a social network space to become a learning space…".

This conceptualization of learning as a social phenomenon allows me to explore relationships between social participation and social learning. While I have discussed theories surrounding social learning in different contexts, I will now look at what constitutes social participation by exploring participation in social media. Further, I will examine literature related to participation in online activities and communities as I seek to discover relationships between online learning and online participation. These twin-aspects of participation can help to bridge gaps in understanding participation in online social network sites, the key focus of my study.

2.3   Part three- Participation in Online Social Networking Sites

Having found literature to support the idea that teachers can engage in professional development in alternative learning spaces, I now focus the review on exploring teachers' participation in online social networks (SNS). Examining the literature on participation in online spaces allowed me to find ways of describing participation in these spaces so that I could develop a theoretical framework to measure participation in online social networking sites. This review also allowed me to explore benefits and challenges that participants may face in online spaces to further refine my study. I focus my research on studies with teachers as far as possible.

2.3.1   Defining and Describing Participation

Participation in online learning spaces has been receiving attention recently by researchers in an effort to comprehend what online participation really is. I have found many studies that sought to measure participation in online spaces but did not attempt to explain what participation was in the context of the study. Online participation as measured by the frequency of visits to the space (Davies and Graff, 2005; Khan, 2005) or the time spent online (Karam and Dutt-Majumder, 2010) has been found. In a study related to student participation on Facebook and student engagement in extra-curricular activities, Junco (2012) examined frequency of Facebook use as well as participation in Facebook activities but used time to measure engagement as participation in class preparation and extra-curricular activities. Participation in online courses is often investigated together with the notions of

attrition or dropout (Nistor and Neubauer, 2010) as it has been argued that participation affects the degree of learner satisfaction and retention rates in these courses (Hrastinski, 2008). Knowlton (2005) focused on defining participation in asynchronous discussions and developed a five-tiered taxonomy. These research studies may be classified as how and when participation occurs as well as what research approaches were adopted to the study.

Hrastinski (2008) draws on the work of Wenger (1998) and others and conducted a literature review on participation in online environments. He found that while participation was generally conceptualized as 'writing', he was able to categorize six levels of participation from the literature to include 'accessing the online environment' at the lowest level to 'joining and taking part in a dialog' at the highest level. With an increase in online discussions, Hrastinski (2008) analyzed participation by measuring the quantity and quality of messages, learner perceptions, message lengths, number of system access and logins, number of read messages and time spent online and argues for a multi-dimensional perspective of participation to include more than writing as 'doing, communicating, thinking, feeling, and belonging'. Hrastinski (2008, 2009) puts forward a definition of online learner participation in e-learning as

> "a process of learning by taking part and maintaining relations with others. It is a complex process comprising of doing, communicating, thinking, feeling and belonging, which occurs both off-line and online" (Hrastinski, 2008, p. 1761).

The author acknowledges that he did not include Web 2.0 tools or social networks in his search but suggests that as online environments grow to include multi-modal forms of communication, the definition may evolve as well.

Bishop (2006) examined reasons for adults to participate in online communities and used Maslow's hierarchy of needs to argue for goal-attainment as a major motivating factor. He used Mantovani's metaphor of the term 'actor' to describe users of virtual environments and suggested that these 'actors' experience a desire to carry out an action, such as solving a problem of another actor (level 1), interpret whether taking this action is consistent with their goals, plans, values, beliefs and interests (level 2) and use their abilities to carry out the action and perceive the environment they are part of (level 3). Preece and Schneiderman (2009) also suggest that participants take on different roles while participating in a SNS and propose the 'Reader to Leader Framework' to describe four graded levels of participation. Sanchez-Gonzalez and Alonso (2012) analyzed user participation in a range of online

newsmedia and focused on the ways various Web 2.0 tools afforded the user to participate. They constructed a comprehensive set of criteria to analyze the nature of, the roles played, the tools used and the times and frequency of participation and found significant differences in participation.

At this time, Hrastinski's (2008) definition of online learner participation most closely fits the context of this study even though it does not specifically address what participation is on an SNS. The review conducted thus far seems to suggest a need to adopt a comprehensive and broad framework of participation for exploration of teachers' participation and which involves not only times and frequency but also nature of and roles of participation.

2.3.2   Roles of Participation and Practice

The literature pays attention to the roles or stances that participants take in online environments and how they differ. Lave and Wenger (1991) describe participation in terms of community as the 'way individuals understand, take part in and subscribe to the social norms, behaviours and values of the communities in which they participate'. They may also choose not to participate (or belong to) a particular community and remain 'outsiders' or on the 'periphery'. Wenger (1998) describes participation in a community as 'peripheral' or 'full' and refers to Lave's (2004) use of the concept of 'newcomers' and 'old timers' to describe a person's lifespan in a community, though these descriptions do not explicitly refer to describing novice and experts in a community. So Wenger (1998, p.164-167) summarizes a range of forms of participation as: 'full participation (insider); full non-participation (outsider); peripherality (participation enabled by non-participation, whether it leads to full participation or remains on a peripheral trajectory); and marginality (participation restricted by non-participation, whether it leads to non-membership or to a marginal position).

Categories of participation are usually described in two ways, 'lurkers' and 'posters' (Preece, Nonnecke and Andrews, 2004). The term 'lurkers' is used to describe silent online users and Tan (2008, p. 4) cites other terms with similar notions such as 'browsers' (Salmon, 2002), 'read-only participants' (Williams, 2004), 'non-public participants' (Nonnecke, 2002) and 'vicarious learner' (Lee, 1999). The term 'posters' refers to those who "post" or "put up a message to online publics (forums, email discussion lists, etc.), which usually implies that the message is sent indiscriminately to multiple users" (Tan, 2008, p.7). Research further suggests that participants play different roles over the period of the learning activity (De Laat et al., 2007) and that providing opportunities for every member of the community to become

a full or peripheral member is important for successful participation in that community, such as having lower entry barriers (Hrastinski, 2011). It is also possible to make categories of participation according to stances taken in a collaborative environment, these are '*lurkers, hangers-on, generator, pillar, ghost, free-rider, over-rider and captain*' (Strijbos and De Laat, 2009). Khoo and Forret (2011) adopted a socio-cultural analytical framework to analyze lecturer and student online interactions (evidenced through different types of dialogs) and the ways they participated in an online learning community (adoption of roles). They suggested participant roles of socialite, wanderer, encourager, contributor, supporter and mentor.

Preece and Schneiderman's (2009) Reader to Leader Model for Social Participation allows for four major roles-*Reader, Contributor, Collaborator and Leader*. These authors suggest that while many people participate in online activities by reading, only a fraction will actually contribute by writing in text-based narratives or uploading other digital media forms or including links to other sites or pages. Further, some contributors/ writers may become collaborators in a particular activity or group while a smaller number may emerge as leaders who can mentor novices or maintain the environment. Teacher leadership has been emerging in importance in successful learning environments (York-Barr and Duke, 2004) and a number of characteristics has been found. These include mentoring and coaching other teachers and modeling (encouraging professional growth) (Harrison and Killion, 2007; McGuire and Gubbins, 2010; York-Barr and Duke, 2004); risk taking (Danielson, 2006) and catalysts for change (Harrison and Killion, 2007) by attempting new and innovative initiatives and collaboration and networking (McGuire and Gubbins 2010).

Davies and Merchant (2009) suggest that most communication in an online setting takes place through digital writing, though Hrastinski (2008) challenges the notion that participation in online settings is measured only by writing and suggests that much reading is not passive and that learning may take place through reading others' dialogs which could trigger thought and reflection, even if not expressed in writing on the site itself. Hrastinski's (2008) analysis of online learner participation suggests increasing the number of levels of participation as writing and proposed six hierarchical levels of participation starting from online access to writing to quality writing to finally engaging in dialogs on the Web. His account does not take into account non-text based writings.

Participation can therefore be realized through the kinds of roles members of the community adopt in support of intellectual, social and emotional development over time. In a social network environment, Preece and Schneiderman's (2009) model for social participation seems to be the most appropriate as levels of participation can be modeled through the various roles played by participants. Even though it has been strongly suggested that silent online users comprise a very high proportion of even very successful and active communities (Nonnecke and Preece, 1999; Preece, Nonnecke and Andrews, 2004), the literature does not clearly define a role for silent online users (Hrastinski, 2008; Tan 2008). Even newer graded models like that of Preece and Schneiderman (2009) and Khoo and Forret (2011), do not clearly define or elaborate on this role. Lurking can sometimes have negative and 'sinister' connotations (Nonnecke and Preece, 1999) and seems to have a somewhat dubious meaning in an online community of learners. As such, in this study, I will not use the term 'lurker' to refer to silent online users but prefer to use the terms 'reader' (Preece and Schneiderman, 2009) or content consumer (Davies and Merchant, 2009; Phang, Kankanhalli and Sabherwal, 2009).

2.3.3 Social Participation, Presence and Identity

The connected nature of SNS enables participants to interact with each other in a number of ways. Social participation has been identified as a key characteristic in Web 2.0 spaces (Davies and Merchant, 2009) and I have earlier found literature that supports a multiplicity of ways that SNS enable users to collaborate, communicate and interact through a variety of embedded synchronous and asynchronous Web 2.0 tools. As participants interact with each other and through Web 2.0 tools embedded in the SNS, the nature of their interactions also become important in order to make meaning of learning in a new socially constructed context (Conole, Galley, and Culver, 2011).

In addition to social participation, how participants allow their presence in an online social space to be revealed is significant to understanding participation in a SNS (Davies and Merchant, 2009). Participants can establish their presence on a SNS through development of a user profile and can allow others to 'see' when they are logged in and in what activity they are engaged. Early attempts to define social presence are contextualized in online learning courses and involve varied understandings of "the degree to which people are perceived as real in computer-mediated communication" (Gunawardena, 1995), the "perceptions of being in and belonging to" an online course (Picciano, 2002) and "an ability to socially and emotionally project himself/herself in an online community" (Rourke, Anderson, Garrison

and Archer, 2001). Picciano (2002, p. 28) also found a strong relationship between "student perceptions of their interaction …and their perceptions of the quality and quantity of their learning". In measuring social presence in an online learning environment, Kim (2009) noted its multi-dimensionality and its importance in observing the psychological state of participants. Brady, Holcomb and Smith (2010) suggest that SNS have the potential to build social presence even in online courses since both the medium and the participant impact social presence which they suggest leads to reduced feelings of isolation and detachment while simultaneously encouraging student interaction and participation.

Ideas of social identity become important to this review as theoretical perspectives of situated learning support the idea that participation enables or constrains opportunities to develop identities and practice. A central idea is that we belong to a small number of groups (work-based or socio-cultural) at the same time and carry a number of identities (Tajfel and Turner, 1986) and that identities are constantly evolving. The emergence of new social identities to fit a changing world filled with virtual environments has caught the attention of researchers and suggests that social identity and online identity are intertwined. The ways participants modify their space are signals to their identity. A SNS usually allows a number of customizable pages where participants can upload a profile picture or personal links or images that allow a degree of personalization by the participant. Davies and Merchant (2009) refer to two types of identities while participating in an online social network-*transient* and *anchored*. The development of a 'plural narrative' (Merchant, 2006) depending on the audience suggests that participants reveal different aspects of themselves over time and space. Burnett (2009) identifies a teacher's struggle to maintain a professional identity while being in online learning spaces and suggests that this struggle is a reason for non-participation. The potential for conflict between a teacher's social and professional identity is significant when a social network site is being explored for professional development and learning and the potential state of flux in performing online identity gives me room in this study to explore the development of teachers' professional identity in a social space.

Participants' presence on the site, the roles they play and the way they make their identities known are signals to their participation and learning. SNS allows for the embedding of 'social objects' or 'cultural artifacts' such as videos, pictures or a discussion topic about which interactions can take place. Participation can take the form of comments, links, forum discussion or blogging and this in itself generates content on the site. This dynamic allows a social network space to become a learning space "if we conceive of the social object as a

learning object, distributed communication and knowledge building can be supported by the tools that constitute Web 2.0" (Davies and Merchant, 2009, p. 121). Web 2.0 tools emphasize participation over presentation, where conversation takes place in a different mode from traditional writing, almost as a new language, and "purposeful tinkerings that often form the basis of a situated understanding emerging from action not passivity" (Brown and Adler, 2008, p. 14). The opportunity to upload new content or edit existing content allows participants to be self-publishers in a free space, thus enabling them to be both producers and consumers of knowledge that crosses traditional forms of learning especially for teachers.

How participants advantage themselves of the participatory opportunities on a SNS may give clues about their practice. In a situated learning context, participants may develop their practice by observing and imitating others and by experimentation with practice can allow their identity to reveal itself. If we accept 'practice' to be 'doing' (Wenger, 1998) and hence 'activity', then we can understand 'participation' as 'meaningful activity' where meaning is developed through relationships, and shared identities allows for a better understanding of participation. In this study, I will adopt the interpretation of participation as 'meaningful activity' and explore what constitutes 'meaningful activity' for teachers in a virtual environment. Bakkenes, Vermunt and Wubbels (2010) described learning outcomes from teacher participation in activities at work as changes in cognition and behavior and these included changes in knowledge/attitudes/beliefs; intentions to practice what was learnt; reported changes in practice and changes in emotions. They noted that teachers' participation varied across activities, which included experimentation and reflection on practice.

2.3.4 Teacher Participation in Online Learning Spaces

In the previous sections, I combed the literature in search of a definition or description of participation in online spaces and have embraced the idea that participation means meaningful activity. In this section, I aim to review what the literature says in specific reference to teachers' participation in online spaces. I have found that research addressing student participation in online courses dominates the literature with less attention drawn to that of teacher participation in online spaces.

From my review of the literature on teacher professional development, there seems to be a number of constraints related to time, curriculum and administrative demands. Teachers seem unable to access support from their colleagues and are further disadvantaged while attempting new practices, especially related to the adoption of new technology, as support

from experts and colleagues wane after professional development seminars conclude. While literature on teacher professional development addresses the tension between the paucity of these programs and the lack of attention to teachers' informal learning at their workspaces, I have not found many studies that focus on how teachers participate in an informal learning space, much less to that of an online social network site. In those studies that I did find, it was difficult to glean clear reasons for teacher participation in existing SNS as the approaches to the studies were diverse as well as the methods of analysis. I have, again, decided to exclude studies on popular SNS like Facebook and Twitter, as the premise of a professional learning space appears to be absent.

Research on long-standing teacher networks like the *Education Network of Ontario* (Beam, 2002) and *MirandaNet* (Cuthell, 2002) imply that teachers engage in shared learning and in creating knowledge related to curriculum implementation that would not be possible alone. Some of the studies that I have selected to look at are based on the use of Ning as this most closely resembles the context of my study. Knowledge sharing has been cited as a reason for participation in SNS (Schlager and Fusco, 2004) as well as battling teacher isolation. Ostashewski and Reid (2010a) noted that the use of SNS increased teacher-participant reports of satisfaction in professional learning programs and led to a greater sense of community, thus decreasing participant feelings of isolation. While Thistleton-Martin and Lewis (2009) did not perceive the use of a SNS like Ning as a learning space, they focused on the advantages of the site to build a sense of community among beginning teachers and to reduce anxiety and isolation as they entered their various school settings. Hur and Brush (2009) found five major reasons for K-12 teachers' participation in self-generated online communities, which are sharing emotions, combatting teacher isolation, experiencing a sense of camaraderie, exploring ideas and utilizing the advantages of online environments. Teachers also appear to prefer opportunities to collaborate in a highly interactive space such as Google Docs to other spaces and engaged in networking while constructing their knowledge on the new task (Aarreniemi-Jokipelto, 2011). Resource aggregation, the opportunity to participate in professional development courses and the ability to elicit expert opinions from mentors and colleagues have also emerged as benefits to teacher participation in designed SNS (Conole, Galley and Culver, 2011) as well as the opportunity to use Web 2.0 tools on Ning and model its use for future classroom projects (McPherson and Castellani, 2008).

For the purposes of further investigation, I collapse the reasons stated above into three main themes: knowledge sharing (Booth, 2011), information seeking (Hew and Hara, 2007) and emotional/social connections (Hur and Brush, 2009).

2.3.4.1 Knowledge Sharing

The way knowledge is created and shared on spaces that are enabled by Web 2.0 technologies has gained interest among researchers like Dede (2008, 2005). Traditionally, knowledge flows from experts to those desiring information for edification or practice has been more highly valued than informal learning from peers and colleagues. However, Web 2.0 tools enable real-time and quick communication, which can afford teachers the knowledge they need and want and cause a positive impact on practice. In addition, these tools allow for teachers to become self-publishers and authors using both text and non-text based forms or media. Dede (2008) describes this shift in knowledge flows as "seismic" and presents an epistemological dilemma about how we view knowledge and knowledge flows. The practices that teachers share, allow for the formation of social ties through which expertise can flow, and the more that particular teachers share with respect to practice (e.g., a common grade/class level or similar philosophy of teaching), the more readily information and knowledge is likely to flow (Brown and Duguid, 2001; Wenger, 1998). The issue of trust is central to this sharing (Booth, 2011; Pardo and Nussbaum-Bace, 2011) and developing a sense of community (Kim, 2009).

A predominant theme in the literature on participation is contextualized with students in formal online courses at higher education institutions and I have examined these in order to provide a base for related findings applicable to teachers' participation in online spaces. Generally these studies have not shown that students engage in high-level interactions. Gunawardena, Lowe and Anderson (1998), for example, developed a model and coding scheme for categorizing online interactions in terms of knowledge construction and found that participants' interactions occurred at the two lowest levels. These were in 'sharing/comparing of information' (Lee and McLoughlin, 2008) and 'discovery and exploration of dissonance or inconsistency among ideas, concepts, or statements' but not higher levels such as 'negotiation of meaning/co-construction of knowledge' or 'applications of newly constructed meaning'. Zhu (2006) analyzed interactions among students and their levels of cognitive engagement in asynchronous class discussions and found that the power/control of learning remained with the instructor of the course but levels of cognitive engagement ranged from low to high. Kim and Bateman (2010) found that students mainly

operated at the lowest level of knowledge sharing as they mainly engaged in monologic opinions and many of their online posts did not accommodate the perspectives of others.

Pardo and Nussbaum-Beach (2011) sought to describe the conversations within a teachers' asynchronous online community and found that most comments posted were broadcasted to the whole community regardless of role, and that members mostly shared information and experiences but were less likely to engage in analytical discourse and negotiation of meaning. They also found that out of a hierarchy of knowledge components, the three most utilized levels of knowledge building were knowledge sharing, sharing a point of view and sharing/contrasting experiences. The least used knowledge functions were the highest order skills of negotiation of meaning and professional growth. Chai and Tan (2009) reported success in teachers engaging in knowledge building in a computer- supported collaborative environment. Hew and Hara (2007) analyzed teacher participation in a listserv to discover the nature of the knowledge that teachers shared and found book knowledge, personal opinion, personal suggestion and institutional practice. In a blended learning program for beginning teachers in Australia, survey data indicated that beginning teachers rated professional opportunities to share professional strategies highly (Jordan and Elsden-Clifton, 2012).

Ardichvili (2008) found several reasons why participants in a virtual community will share with others and these include self-esteem, emotional ties, reciprocity, material gain, intellectual challenge and for professional image a need to be perceived as knowing. Hew and Hara (2007) similarly found that reasons teachers share knowledge in an online space included egoism, altruism, personal interest and collectivism. These authors listed the following as barriers to knowledge sharing: lack of knowledge, lack of time, technology, not wanting to cause a fight, and negative attitude of seeker while Ardichvili (2008) suggested fear of criticism, cultural factors, lack of clarity on what to share and technological ineptitude. This author suggested that these barriers could be overcome through development of trust in the environment, a supportive learning culture and the affordances of Web 2.0 tools.

2.3.4.2   Information Seeking

Online spaces that foster an environment for producers of knowledge (knowledge-sharing) can also sustain consumption of knowledge (knowledge-seeking) (Phang, Kankanhalli and Sabherwal, 2009). Asynchronous tools such as emails, discussion forums and chats enable participants in an online space to seek knowledge from peers and experts. In analyzing

students' posts in exploring student participation patterns in online bulletin boards, Kim and Bateman (2010) found that there were instances when students asked questions about the topic being discussed and even probed the matter further, though posts related to information seeking in this study was found to be less frequent than those of knowledge sharing. Hur and Brush (2009) found that teachers searched for very specific ideas that were appropriate for their specific contexts, for example how to teach poetry to second graders.

2.3.4.3 Emotional/Social Connections

While most of the literature on teacher isolation seems to reference those in higher education institutions, I ascribe similar notions to that of secondary teachers (Drago-Severson and Pinto, 2006), especially in large schools (greater than 800 students) where classrooms are geographically dispersed. Rural schools also suffer from being isolated from others and the literature does indicate support for the idea that teachers suffer from the lack of an audience of peers. According to Chenoweth (2009), the traditional organization of schools, which relies on isolated teachers doing their jobs with little interference and less support, means individual students are totally reliant on the knowledge and skills of their individual teachers. They (and their teachers) have little access to the broader expertise of a school's teachers or the accumulated wisdom of the education field as a whole.

In order to battle teacher isolation, there seems to be significant support for teachers to participate in networked communities due to the ease of forming connections with peers and significant others. Hadar and Brody (2010) reported success in teacher educators breaking down personal and professional isolation through participation in a professional community by not only becoming acquainted with peers, but working together to address common concerns about student learning. Dodor, Sira and Hausafus (2010) analyzed teachers' postings on an electronic bulletin board and found that it provided a common place where members felt comfortable sharing their own experiences with people they had never encountered in face-to-face interactions. They suggest that computer-mediated communication fostered a sense of belonging to a learning community where members did not feel threatened by engaging in the dialogue. This sense of belonging to a community recurs in the literature (Kim, 2009; Lu, Phang and Yu, 2011) and has been a significant factor in examining social presence and in participation in online communities generally.

2.3.5 Summary

In this section, I have attempted to define and describe participation in online spaces and in particular, in SNS. Participation in various activities, groups or social settings is not a new concept but an attempt to research its meaning in an educational context has not yielded much congruence in definition. Studies have challenged the way participation has been measured and suggest that frequency counts are inadequate (Hrastinski, 2008). Newer studies suggest that an examination of the roles or stances that participants take in an online environment can contribute more to understanding the nature of participation (Preece and Schneiderman, 2009). I have examined concepts of online participation (Hrastinski, 2008) against the background of socio-constructivist learning frameworks where Wenger's (1998) descriptions of participation, identity and practice form a base of understanding together with theories of social participation where social presence is integral to participation (Davies and Merchant, 2009). In attempting to explore teachers' participation in an online social network where professional learning is emphasized, an analysis of the roles that teachers may play seems to be significant and also, how these roles reveal their online identity. The literature on teachers' participation in online communities indicated that there were three main reasons for participation, which were knowledge sharing, knowledge seeking and emotional/social connections.

2.4   Summary of the Literature Review

This review was organized into three parts in order to address the three major research concerns in this study. In Part one, I examined online social networking sites, SNS, and found a number of new studies exploring their use in education, but more so in higher education institutions. A significant characteristic of SNS is its social and participatory nature, which can allow for interactions among teachers. Embedding Web 2.0 tools in an SNS allows asynchronous and synchronous interactions to take place and affords participants (Lee and McLoughlin, 2008) a number of benefits including flexibility in time, space and choice of activity. Existing studies are new and non-definitive in approach. A number of global online teacher networks exist but do not offer teachers in Trinidad and Tobago a space to address local issues or share indigenous resources. In Part two, a move from teacher professional development to professional learning (Feiman-Nemser, 2008) was argued as this allows for a more learner-centred model for teacher learning. I looked at themes in adult learning theories such self-directed learning and teacher professional identity. The concept of teachers learning

informally inside and outside of their workplace provided a context for non-traditional learning spaces (Selwyn, 2007) to be considered and support for non-structured professional learning on this space. I examined theories of online and social learning to describe what learning can look like on a SNS. Research trends suggest the use of a socio-constructivist framework for online learning as learners construct new knowledge from prior knowledge and interpret the world according to their personal reality (Ally, 2008). Situated learning refers to learning in authentic and real-world contexts. The literature also points to new directions in teacher learning initiatives that suit the realities of today's teachers. Participation in online teacher networks is suggested as beneficial to their informal learning. While there is no model for learning on a social network site, ideas linking participation to learning are strongly suggested. So in Part three, I examined ideas that participation can lead to learning and that learning can occur through meaningful dialogs among participants (Lave and Wenger,1991) and increasing participation in site activities. Davies and Merchant's (2009) model of a social learning space is predicated upon social partcipation for learning and is useful to understanding the nature of participation in a social network site. The literature suggested that teachers could benefit from participation in spaces similar to SNS through knowledge sharing, knowledge seeking and emotional support.

This literature review has been helpful in identifying potential educational affordances of Web 2.0. Even though theoretical frameworks are still evolving to support learning with and through Web 2.0, especially in networked collaborative environments, the potential of Web 2.0 to engage teachers as learners is probably the best approach that I can adopt in this study. In this regard, the 'best approach to helping teachers learn about Web 2.0 may well be to have them learn with Web 2.0' (Albion, 2008, p.5). I distinguish therefore, between teachers using Web 2.0 tools in the classroom for enhanced student learning to they themselves engaging with these tools either through their own efforts or in formalized professional learning initiatives. I believe that this is the key to teachers becoming confident and competent in harnessing the educative potential of Web 2.0 tools.

Based on my findings in the literature, I need to examine my three research questions along the lines of smaller research questions. I have discovered that the roles that participants play is critical for examination as well as their interactions with each other. The embedding of Web 2.0 tools on an SNS has the potential to afford participants many benefits and this study allows an exploration of these affordances. Further, in examining the potential for SNS as a space for informal learning for teachers, I have discovered that while teachers can benefit

from participation in global networks, learning can be enhanced if it is situated in authentic contexts and learners can construct their knowledge based on their own realities. This allows me to consider that a localised SNS can be beneficial for teachers in Trinidad and Tobago. In the absence of a model for learning on an SNS, I have examined theories related to online and social learning. Linkages between online participation and online learning and social participation and social learning have been suggested in the literature and this study also explores these linkages.

3   Methodology

This research study was designed to help me to explore how teachers can participate in a special-interest online social networking site. My search through the literature, in Chapter 2, has indicated that online social networking sites can be useful in education and this study considers whether teachers' professional learning can happen as a result of their participation. In order to explore these issues, I have developed the following research questions:

1. How do teachers participate in an online professional social network?
2. Are there benefits to teachers participating in an online professional social network?
3. Can teachers' participation in an online professional social network lead to learning?

In this chapter, I describe and justify the research methodology I have used, describe the participants and methods of data collection, the procedures used for analyzing data and how I addressed ethical concerns related to Web research. In the next chapter, I describe how the site, *TrinbagoTeachersUsingTechnology,* was set up.

3.1   Action Research

As I examine my role as an officer within the technical arm of the Ministry of Education, I have experienced a tension between my values and that of the Ministry. I feel that teachers' voices are not heard and that there are few opportunities for teachers to connect with and learn from their colleagues. I feel that there is a lack of democratic principles in decision-making and Curriculum Officers are unable to effectively support teachers' practice and growth. As I seek to provide a forum for teachers to support each other, I have examined various methodologies to underpin my research. I have decided to use a participatory action research approach, as I want to change the ways teachers are supported as they engage with technology tools in the classroom. I see my role as researcher as that of working with teachers in reflecting on their practices and supporting them through a process of reflection and action. Action research can be defined as a form of self-reflective enquiry undertaken by participants in social (educational) situations in order to improve the rationality and justice of their own social or educational practices, their understanding of these practices and the situations in which the practices are carried out (Kemmis, 1988).

I consider action research methodology to be relevant to my context in Trinidad and Tobago for several reasons. Firstly, action research places the practitioner as the main actor in his/her research (McNiff, 2001), in this case, me. Secondly, it can be tailored to my specific historical-social context and allow me the freedom to choose which methods I wished to use (Kemmis and McTaggart, 2005). Further, action research is about empowerment and change and liberating practitioners from existing cultural practices. In the main, I believe that action research is about me interrogating my practice in the here and now (Kemmis, 1988), which can lead to me being more effective as a curriculum officer.

3.1.1 Participatory Action Research as a Decolonizing Methodology

There are usually clear lines drawn between the researcher and the researched but participatory action research allows for the blurring of those lines as the researched have a say in how the research proceeds. The inclusion of research participants in the decision-making process acts as a democratizing force (Smith, 1999) and foregrounds the voices of Trinidad and Tobago teachers (Lincoln and Gonzalez y Gonzalez, 2008), who were previously voiceless. Further, both the researcher and participants are from the local setting. I am suggesting that action research is a decolonizing methodology and is appropriate for my study set in post-colonial Trinidad and Tobago. While there is an expectation that educational reform requires teachers to be agents of change, they must be "empowered to do so" (Feraria, 2008 p. 277).

Having inherited a system of British colonial education systems that are often critiqued for being 'elitist' and aligned to societal power structures (Altbach, 1971), secondary schools in Trinidad and Tobago are often seen as perpetuating social class structure. Teachers, hired by central government, often adopt traditional classroom practices and accept professional development initiatives with hesitation. There are numerous studies conducted on teachers to understand their practice, but research on teachers often suffers from interpretations from external agents bereft of school and cultural contexts of teachers. Teachers as the researched are the *subject* of discussions without having a voice in that discussion. Participatory action research is a methodological approach that offers me an opportunity to reflect on my practice as curriculum officer *with* instead of *on* teachers.

3.1.2 Role of the Researcher

As I reflected on my practice, I came to realize that I needed to find more effective ways of supporting teachers' efforts in the classroom. I have thought out possible ways to provide

more sustained support and to allow for multiple ways of interacting with them. My action is to create a learning space that enhances social interactions and allows teachers to upgrade themselves professionally and to have choices in professional activities.

As an action researcher, I approached this research study with intent to work *with* teachers and other officers to solve some of the problems that teachers face in integrating technology in the classroom. I was not satisfied with simply conducting research *on* teachers. As such I became part of this new learning community, even as I was the designer of the space. So my role in this study is designer and participant, architect and evaluator, support, mentor and colleague as well as observer, collaborator and leader.

3.1.3   Phases of Action Research

Action research covers a broad array of research strategies that are dedicated to the integrated production of knowledge and the implementation of change (O'Leary, 2004, n.p.). Some of the hallmarks of action research are commitment to action, participatory, systematic and knowledge-generating and cyclical. Further it can only be enacted by the actor herself in this case me. The following diagram (Kemmis, 1983, in O' Leary, 2004, n.p.) shows the cyclical process in action and can be conducted in several phases.
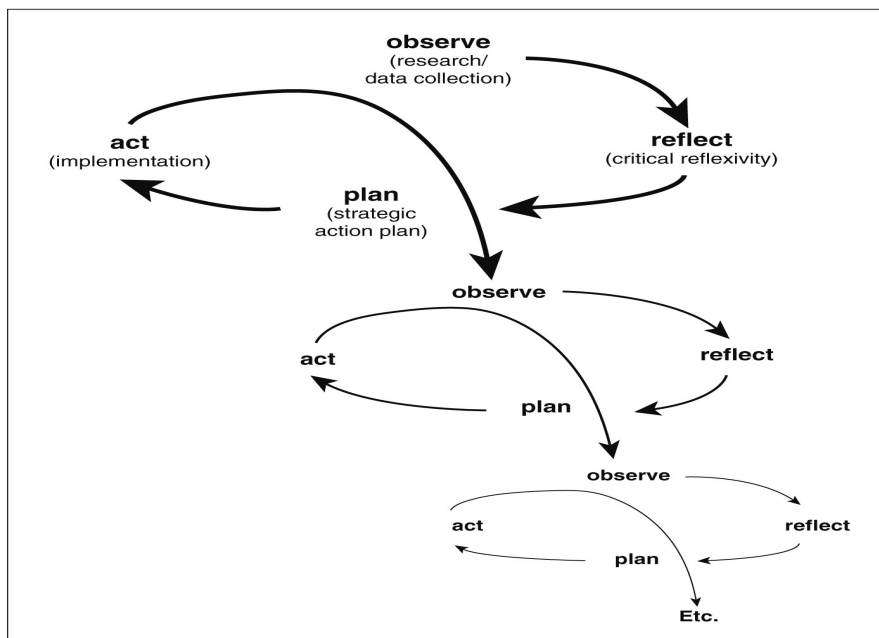
Figure 3-1 Cycles in Action Research

This research took place during the third term of the academic year, April-July, and the July-August vacation thereafter and was strategically timed when teachers were free of

examination preparation and would have the time to participate. I conducted this research in three phases, which are summarized here.

Phase 1: Set up Website. Design activities and send out invitations to teachers and MOE officials. Seek input from critical friends from the MOE on design.

Phase 2: Launch Website, observe participation for four weeks and seek opinions on site from participants.

Phase 3: Redesign website according to useful suggestions and observe participation until the end of the school term. Reflect on the term's participation and seek opinions on the site for next cycle. Use combined online survey of site participation and a face to face meeting with critical friends and selected participants to interrogate certain aspects of existing data and trends, such as reasons for low or non-participation. (See Appendix 11)

Phase One

The first phase of the research study took place from April 15th to June 8th. In this phase, I planned to design the website for teachers and sought advice from my co-workers at the MOE. I used a focus group with curriculum officers and education technologists. The purpose of the focus group was to initiate conversations about a collaborative participatory approach to this study (Nicholls, 2009) by involving them actively in the design and implementation of the research study. I wanted to do this in order to see whether a more inclusive approach to my research would lead to a change in the way that teachers are supported in their classrooms. I asked officers from all eight core curricular areas, as set out in National Curriculum documents for Secondary schools, and co-opted volunteers. I also invited educational specialists from the ICT division. These persons were intended to be my critical friends, who would support me in the implementation of the study.

At this focus group, two curriculum officers, who were my friends and two educational technologists helped me to brainstorm about ideas for the website and how to gain access to teachers. It was suggested that teachers would not participate unless they were interested and could have gained from the research study. We also decided that teachers should have entry-level skills in using the Internet and computer technologies. It was decided that teachers who were participating in the 2011 *ecal ICT in Education Innovative Award* initiative might be a useful sample to draw upon. Since teachers had voluntarily participated in this competition, we concluded that they might be amenable to participation in a research study that was using

an online social networking website. Through the efforts of one of the educational technologists, Ms. B., I gained access to these secondary school teachers and as such Ms. B became a critical friend. On April 30th, Ms. B. organized an ICT seminar at the RCLRC, Couva and she allowed me to interact with invited teachers. This strategy proved to be advantageous to me as it reduced the effort in seeking out participants by visiting schools or sending out mass invitations. Teachers seemed to favor being part of the research and expressed willingness to participate, as such the strategy was successful.

Sixty-six (66) teachers expressed willingness to participate in the study and email invitations (see Appendix 5) were sent to them during the week of May 10th to 17th. These teachers came from schools in all seven educational districts in Trinidad while email invitations were sent to two Tobago teachers, separately. Of these, thirteen (13) teachers agreed to participate by completing the consent form and returning via email. The email invitation explained the nature and purposes of the research study and a consent form to complete and return. I decided to use this online method instead of face-to-face as it would give an initial feedback to me about the level of ICT use for communication by a potential participant.

During the months of April to May, I researched information on the design of the website. Information from my meeting with the two educational technologists and the two curriculum officers informed the design. I describe the site design elements in the next chapter.

Phase two

I launched the website on May 15th, after obtaining consent forms (see Appendix 6) from 13 teachers. No curriculum officer or educational technologist had sent in consent forms at this time but did so thereafter. I adopted the role of site administrator, discussion facilitator and participant researcher. During this period, I was online for more than 18 hours per day, observing who would come online and when and what activities seemed more popular. After four weeks of participation, I sought response on the site's content and activities and included their suggestions into the design. I used an online survey instrument through Zoomerang.com (see Appendix 9). I also continued to send out email reminders to teachers and MOE officials who had expressed initial interest in joining the research study but who had not yet joined the site.

As such in this cycle, members registered on the site and added content to it. The content of the site as well as the site activities was therefore automatically collected. I signed up with

Google Analytics to monitor site progress. The site administration at Spruz.com assisted in working out snags. Based upon the results of the online questionnaire (Appendix 9), I made changes to the design of the site. Incidentally, Zoomerang.com migrated to SurveyMonkey.com after the research study. Members suggested the use of Facebook links and inclusion of Facebook-like options. As such, I included widgets, games, the 'like' and 'Rate it" button features. Based upon my continuing research into web tools, I expanded site activity options by including a wiki page during this phase.

Phase three

The next cycle continued through the end of the term where I had planned to end the period of research. At this time, I wanted to meet again with MOE colleagues and teachers to have a conversation about the study, their views on it and obtain an evaluation of the site. This may be described as the third level of reflexivity, which Nicholls (2009, p.123) suggests calls for discussion amongst collaborating participants about the effects of taking part in research; to reflect together about whether participating was "transformative, affirming, cathartic or empowering". To do this, I invited MOE and teacher participants to attend a face-to-face session and offered options of time and place (see Appendix 7). Teacher participants generally wanted an online survey while MOE participants wanted a face-to-face. As such, I sent out online evaluation questionnaires to teacher participants (see Appendices 10 and 11) to share their experiences and seek opinions about plans for the July-August vacation. Results of this questionnaire indicated a willingness to participate in online professional development during the July-August vacation so I decided to extend the period of study. This enabled me to extend the period of research and observe teachers participation during the school term as well as their vacation. I decided to terminate the research at this time as the total time for the research lasted from April to the beginning of September and three cycles of action research had elapsed.

Since I had to plan a face-to-face meeting with MOE participants, I decided to ask selected teacher participants to join in as well. These participants were selected specifically to elicit opinions on levels of participation of their peers (low levels). I broadly used the questionnaire in Appendix 11 to guide this meeting and was able to get information about the site design and opinions on teachers' participation. Of the six teachers invited specifically to explore reasons for low levels of participation, three of these turned up. Opinions supplied are presented in Chapter 5 in section 5.5.4.6.1. The other three teachers indicated that they could

not attend, as they were too busy. At this meeting, two curriculum officers attended (different from the ones at the first meeting) and two education technologists, who were active participants on the site. Unfortunately, Ms. B, who had helped me to access teacher participants in Phase 1, was unable to participate on the site or to attend this review meeting due to demanding work schedules. She continued to express oral support for my research.

3.2   The Participants

Selecting participants for this study required careful consideration as teachers generally have busy schedules and attempts to create professional networks in the past have been largely unsuccessful in Trinidad and Tobago. I decided to focus my efforts on secondary teachers rather than primary as I could hone content areas more accurately with the help of fellow officers at the Curriculum Division of the MOE who are generally specialists in secondary level curricula. In addition, secondary teachers, unlike primary, have scheduled 'free' slots on their timetables for planning lessons, attending department meetings and evaluating students' work. It was anticipated that their more flexible schedule could lend itself to successfully participating in an online forum. There were 34 registered participants by the end of the research period, with 7 persons being MOE officials.

3.2.1   Teacher Participants

Teacher participants in this study were those who had previously submitted for the *ecal* competition and included two teachers who had advanced to represent the country at the International competition. The participants in this study were teachers and middle managers at secondary schools in Trinidad. There was one Vice Principal and two Heads of Department. Participants came from all seven geographic districts in Trinidad. No teachers from Tobago participated even though they were sent invitations. There was a fair spread across all curricular areas with Technology Education/Information Technology specialization being more common than others. There was a balance between male and female participants. A summary of teacher participants is presented in Appendix 1.

3.2.2   MOE participants

I issued oral as well as email invitations to MOE officials in the hope that they would become my critical friends. As detailed earlier, three persons in the ICT division and eight from Curriculum Division representing one of each of the eight core curricular subject areas were invited. These officers were important to my research study to provide technical support to

teacher participants and matters related to ICT integration. Of those invited, two persons in ICT agreed to participate and support the site, one an educational technologist and the other a senior programmer II who had been part of significant ICT school project MOE-led initiatives. The third person in the ICT unit, the organizer of the *ecal* competition did not respond to the email invitation to participate but I still considered her to be my critical friend due to her pivotal role in Phase 1, which has already been described, and her continued verbal support through the research. The other two Technology officers became critical friends as they offered advice on the site administration and became fairly active on the site itself.

Officers in five curricula areas agreed to participate- Technical Education, Mathematics, Spanish, Social Studies, Visual and Performing Arts. They joined the site by registering but did not actively participate. Officers in Language Arts, Science and Physical Education did not respond to the invitation. Reasons supplied for non-participation included being very busy and unable to dedicate time to support the initiative even though they liked the idea of the study. As such, I did not consider any of my colleagues in the Curriculum Division to be my critical friends in this research.

Summary of participants:
Curriculum and Technical officers: 7
Teacher participants: 27
Myself as lead facilitator and designer and researcher

3.3   Theoretical Underpinnings

I have based my research on participation in SNS based upon perspectives provided from the literature review. Research on the use of SNS for education purposes has pointed to the value of a socio-constructivist framework as described by Vygotsky (1978) and Lave and Wenger (1991). In particular, theories of learning such as online and social learning are important as it allows for exploration of teacher interactions in informal and non-traditional learning spaces.

3.4   Methods of Data Collection

Using an action research methodology allowed me to use a variety of methods or procedures to collect data. Methodology is concerned with the description and analysis of research methods rather than with the actual, practical use of those methods (Opie, 2004). In order to answer my research questions, I decided not to bind myself to the limitations of one methodological paradigm over another. In order to explore teachers' participation fully, I

looked at both qualitative and quantitative data that allowed me to adopt a more encompassing view of practice and did not bind me to the 'narrow empiricism' of objective *or* subjective perspectives (Kemmis and McTaggart, 2005, p. 573). I suggest that this latitude allowed me greater freedom to understand complexities of the teachers in this study both from an individual and social point of view.

A significant challenge to this research is that the majority of data in this study was generated in the web and through the web. The field of Internet research is still a "shifting ground" (Baym and Markham, 2009) and research studies are not yet conclusive about choice of methods. Data was collected through the Internet and from the Internet since both synchronous and asynchronous Web 2.0 tools are used on this site. In this study, data was captured automatically on the website itself as digital talk and digitally created texts. The website is a repository of data reflecting conversations and connections among participants. Artifacts on the website include naturally occurring talk created by participation in activities such as blogs, wikis and forums. Visual images uploaded by participants such as videos, photos and hyperlinks are included. Some of these images are of the participants themselves or of their students while others are not. Images of participants or their students can be useful to gain insights into participants' practice. Moreover, a history of participation was automatically created through postings that provide data on the name of the poster, date posted and the selected Web 2.0 tool. User created profiles, login history, e-mails, participation in online courses as well as opinions on polls were also generated on the site. As participants were free to engage in different activities on the website and to select Web tools of their choice, capturing data on the selection of these choices and the nature of the discourse among participants are important to this study as these choices indicated how participants saw themselves and others on the website.

Data collected included photos and videos selected for upload, as well as hyperlinks to other websites. I used live and raw data from the webpages from the website which generated 'naturally occurring talk' as well as activity history such as date of post, poster and topic. Discussion forums and blogs allowed for threaded discussions by topic, media-sharing details indicated activity history of file downloads and uploads as well as the digital text associated with the activity. Wiki pages and Google docs allowed for content to be added or edited with participation history while emails allow for responses to queries and for updates. The exact sequence and content of a chat is captured during live chats. Site online polls and surveys were used to collect opinions related to specific questions but participant history and details

were not captured. In order to collect data related to participant history on the site as well as general participant patterns over time, I signed the site *www. techtalk.spruz.com* onto Google Analytics in order to provide data such as frequency and duration of participation. The number and range of activities participated was used to indicate the level of participation in the website. A voluntary online survey was used at the end of the study to investigate how participants felt about the study. At the end of the study, I conducted focus group interviews with selected teacher and MOE participants to explore certain phenomena such as low levels of participation and taped responses were transcribed.

A clear advantage of electronic data collection via a website is the ease of obtaining participant data and maintaining the integrity of that data as website data is held in its original form together with relevant activity histories. The availability of live data nullifies the need for data transcription, whether in word, photo, video or hyperlink forms. The various methods of data collection used are in fact complementary to each other and offered insights into teachers' participation from different angles. In this study, the combination of methods allowed me to add to the body of literature on ways to use the Internet for research and *as* research.

3.5   Methods of Analysis

3.5.1   A Case for Mixed Method Approach to Analyzing Data from a SNS

In attempting to develop a model for analyzing the data in this study, I decided to combine both qualitative and quantitative approaches according to the type of data analysis needed. While there is ongoing debate about the epistemological challenges in mixing methods in studying human behaviours and practices, analyzing and interpreting data on a social network site that is focused on interactions among indigenous people allows for innovative methods. I describe my SNS as indigenous as it contains discourses that are specific to teachers from Trinidad (and Tobago) and hence reflect particular cultural preferences and language. Trinidad and Tobago has a unique cultural and historical context as it is post-colonial and its people are a mix of variety of cultures from Africa, India, China and Europe. Yet it is in the West. Traditional elite groups have been European with other groups emerging in power over time in a society that claims to be multi-cultural. Teachers as participants in this study would be drawn from this culture, in schooling structures that bear the legacies of colonialism.

In adopting an action research methodology, I have the liberty of using both qualitative and quantitative methods in analyzing participant data where necessary. I am not suggesting the use of mixed methods a way of triangulating data (Denzin, 2012); which is viewed by some qualitative researchers as a positivist response to ensuring validity in qualitative enquiry (Cho and Trent, 2006); but more a researcher's response to find sound ways of interpreting participants' discourse in a particular context and time and to improve trustworthiness of interpretations (Kincheloe and McLaren, 2005).

3.5.2 Analyzing Digital Text and Talk

The main data source for analysis in this study was the website itself. Analyzing data on social networking websites requires lens that are non-traditional as describing data from the website is problematic in itself. Webpages contain data that is captured live on the site as participants make multi-modal contributions to the site. Digital text suggests written text as well as other forms such as video, photo and hyperlinks. Written text may appear as conversations between two or more persons and may not follow conventional norms of writing. A social-constructivist framework allowed for a range of contributions from participants, much of which could not be predicted prior to the implementation of the study.

In his description of Social Research methods, Bryman (2008) cites only two examples of analysis of websites, one using narrative analysis, a qualitative approach and the other a quantitative approach. The author (ibid, p. 629) acknowledges that analysis of websites and webpages is a "new field that is very much in flux" and that new approaches are being developed at a rapid rate. Data in this study required a bricolage (Denzin and Lincoln, 2005) of approaches, which depended on the phenomenon that the researcher was interrogating in order to interpret and synthesize data (Kincheloe, 2001). Methods of analysis were required to understand the nature of collegial relations formed (if any), the nature of their ties and patterns of communication among them.

In looking at research studies that focused on analyzing data from an SNS, I have found that the literature points to methodological difficulties in measuring participation in SNS than in face-to-face networks.

> "Education researchers and evaluators must overcome conceptual and methodological obstacles that limit exploration of the frontiers of learning in cyber-enabled social networks" (Schlager, Farooq, Fusco, Schank and Dwyer, 2009, p. 96).

This information has been growing in importance to educators and planners in understanding how to support and promote school change (Schlager et al., 2009).

My search through the literature on suitable data analysis methods did not lead me to any conclusive models for small-scale networks. In analyzing data from online meetings among members of *Tapped In*, a large community of practice for educators, Farooq, Schank, Harris, Fusco and Schlager (2007) used a coding system for uttered and non-verbal discourse but Tsai (2011) used a combination of NETwork, a combination of the framework of Community of Practice and Interaction Analysis Model (IAM) developed by Gunawardena et al. (1997). Rossi (2010) used Actor-Network Theory to account for issues related to ownership of content that was co-created on a SNS. Researchers like Lockyer, Dawson and Heathcote (2010) analyze participant accounts collected though interviews or questionnaires. Bryman (2008, p. 29) suggests that websites and webpages can be considered as "virtual documents" and that they "can be subjected to both qualitative and quantitative analysis" (Ibid, p. 631). These descriptions allowed me to consider a number of different types of analysis including document analysis, conversation analysis, narrative analysis, discourse analysis, content analysis and social network analysis. Based on my research questions, I decided to use a mix of Social Network Analysis, Discourse Analysis and Google Analytics. These methods are detailed below.

3.5.3 Social Network Analysis (SNA)

Research conducted on social networks so far, has tended to use methods of Social Network Analysis also called SNA (Haythornwaithe and de Laat, 2010). This is a new field of study and has gained significant attention in analyzing information flows in knowledge-based SNS. In social networking sites, users create online profiles and make connections with others (friends) (boyd and Ellison, 2007) and SNA analyzes social network ties, the communication, the resources they obtain from them (social capital), and the communication tools that facilitate the flow of expertise. I have selected social network analysis to explore how participants on the site collaborated with each other and to investigate how this collaboration changed over time. SNA allows for exploring learners' perspectives in a networked collaborative structure and is supported by social learning theories (Haythornwaithe and de Laat, 2010). They propose that social network ties can be interpreted as "learning ties" in a learning context.

Social network analysis is not generally included in methods of analysis for qualitative data and classic texts such as Denzin and Lincoln (2005) and Bryman (2008) do not contain it. Perhaps this is because SNA comes from a quantitative tradition in the form of mapping and visualizing social relations by sociologists and anthropologists (Edwards, 2010). But new debates about the use of SNA for qualitative data analysis are taking place. Edwards suggests that

> "SNA represents a specific opportunity to mix methods because of its dual interest in both the 'structure' or 'form' of social relations (i.e. the 'outsider' view of the network), and the interactional 'processes' which generate these structures, and have to be understood by exploring the 'content' and perception of the network (i.e. the 'insider' view of the network)" (Edwards, 2010, p. 18)

A number of researchers have used mixed methods in online research such as combining SNA with other types of analyses such as content analysis (de Laat, Lally, Lipponen and Simons, 2007; Zhu, 2006) while Abdesselem, Parris and Henderson (2010) used a combination of four methods to collect data from sampled Facebook populations. Thus, I agree with Edwards (2010) that the issue of combining quantitative and qualitative approaches to SNA is of particular interest in the wider context of debates over mixing methods in the social sciences because some network analysts have argued not only that it is desirable to combine quantitative and qualitative methods, but that SNA represents a specific opportunity to mix.

3.5.4 Discourse Analysis (DA)

I used discourse analysis to analyze 'talk' on the site, which was represented as digital text. Discourse analysis has an "analytic commitment to studying discourse as texts and talk in social practices" (Potter, 2004, p.203). It is considered as a way of analyzing 'naturally occurring talk' as it provides a useful model for describing social interactions between researcher and participants and 'focuses on language as a medium for interaction" (Silverman, 2006, p. 224). Learning in a socio-constructivist environment is facilitated by discourse (Vygotsky, 1978; Harasim, 2002). DA rejects the assumption that participant accounts are true or false and is concerned with how participants construct their realities. Discourse analysis therefore is predicated on three assumptions: anti-realism, constructionism and reflexivity (Silverman, 2006). Thus DA can allow for themes and topics to emerge and shed light on the social contexts of the participants. While typical DA studies focus on transcripts of talk from everyday settings, this study focused on discourse from the website's discussion forums, blogs and emails and live chats. It was also used to study responses from

participants in focus group interviews. Knowledge sharing in an online space was enabled by discourse. These talks are held on the website and have advantages over speech as there was no need for transcription.

3.5.5 Google Analysis

I used Google Analytics tool (www.googleanalytics.com) to analyze data on the website. A number of reports were generated and these are presented in the next chapter. According to the Google website, Google Analytics works by the inclusion of a block of JavaScript code on pages in the website. When visitors to the website view a page, this JavaScript code references a JavaScript file which then executes the tracking operation for Analytics. The tracking operation retrieves data about the page request through various means and sends this information to the Analytics server via a list of parameters attached to a single-pixel image request. This method of crawling the website allowed me to view participation on the site as a whole over time. While the host platform, spruz.com also does this, the range of tools and reports available is not as wide as that of Google.

3.5.6 Generating Themes from the Data

In attempting to understand participation on the SNS, I developed themes from the data based upon categories and ideas that emerged from examining the literature, and adapted those themes after analyzing data from the study. From my literature review, I found out that participation could be viewed in a number of ways including roles played on the site (Preece and Schneiderman, 2009); affordances of Web 2.0 tools can lead to learning in online spaces (Lee and McLoughlin, 2008; Selwyn, 2008) and that teachers experience both benefits and challenges to participation in online environments (Hur and Brush, 2009). These themes and ideas emerged from my review of the literature and allowed me an analytical framework for answering my research questions (Boyatzis, 1998).

From examining the data, I was able to adapt these themes to reflect findings from the data. In the particular case of exploring benefits to participants, I examined digital text from all activities on the site and suggested codes aligned to those of Hur and Brush (2009). I then grouped these in a matrix by activity and benefit code to generate themes. I used Selwyn's (2008) descriptions of human dispositions on a Web-enabled space to collapse these codes into four themes that described the benefits to teachers participating on the site. For the roles played by participants, I adapted the roles suggested by Preece and Schneiderman (2009) and used a diagrammatic representation to further explain the theory. For examination of my third

research question relating participation and learning, I explored theories related to online learning and social learning from Lave and Wenger (1991), Davies and Merchant (2009) and Anderson (2008). From the data, I was able to develop a list of characteristics for learning on SNS and presented this diagrammatically as well. I used ideas from Lee and McLoughlin (2008); Selwyn (2008); Light and Polin (2010) about the affordances of Web 2.0 tools throughout the study. I present these themes in the next two chapters and support their analysis with the use of tables, diagrams and raw data from the website in live captured forms and screenshots.

3.5.7   Summary of Methods

A summary of analytic methods used in this study are presented here in this table:

Method of Analysis	Data measured	Purpose of analysis	Relevance to Research Question
Social network analysis	Network learning ties, Communication patterns and information flows.	Interactions between participants- Examination of learning ties	3
Discourse analysis	User generated content Discourses in postings from site activities. Interview data.	Affordances of Web 2.0 tools/ benefits to participants Reasons for participation	2 1
Google Analysis	Site visitor data, Length of visit Depth of visit Pages visited	Participant information and participation patterns- Frequency and duration of participation in terms of visiting and posting Participant contributions	1

Table 3-1 Summary of Analytical Methods

Sociological perspectives guided the choice of methods selected for this study and the nature of the data allowed for opportunities to use of an eclectic set of methods. A combination of methods were selected to analyze the range of data that the website captured. This

combination was enabled by the newness and transient nature of data from social network websites and the dearth of frameworks available for analysis. Social Network Analysis was used to map interactions among participants to provide information about participant preferences in interactions and communication. Discourse analysis was used to analyze talk and interactions o the site. Simple frequency counts of participation in different activity levels were performed to determine preferences of choice of tool in synchronous and asynchronous activities. Google Analytics tool was used to explore duration and extent of participation in the site and particular activities. These methods were complementary to each other and all helped in analyzing different aspects of participation on the site as directed by my research questions.

3.6   Ethics

In this study, I was faced with a number of ethical concerns that affected the participants, the data and the study itself. Several of these are generic to social science research but others surfaced which were particular to this study due to the 'fluidity' of participatory nature of the research (Nicholls, 2009). Most critically, was my level of reflexivity as was needed throughout the three phases of the action research process. Because participant data is live on the website, I also addressed issues related to participant consent, data privacy, anonymity and confidentiality, legal and security issues and blurring of ownership of user generated content (Snee, 2008). I took great care to address these issues at the beginning and throughout the study. Ethical clearances and approvals for the research were obtained from the University of Sheffield (see Appendix 4) and the Ministry of Education (see Appendix 3)

3.6.1 Participant Consent
At the beginning of the research period, prospective participants were emailed a document outlining the nature and purpose of the study and a consent form to complete and resend via email (see Appendix 5). They were also informed about submissions of video and pictures of themselves and students and regulations regarding these. These regulations were guided by that of the employer Ministry of Education of Trinidad and Tobago e-policy documents and are applicable to all forms of research, online or otherwise. All participation was completely voluntary and participants were reminded that they could participate how and when they

wished, without any obligation. They were free to exit the study at any time and select the tool and the activity of their choice over time.

3.6.2   Data Privacy and Anonymity and Confidentiality

The website has a number of public and private pages. Certain webpages on the site like the homepage can be browsed without being a registered member but other pages are private to registered participants such as pages where downloads of materials and collaborative spaces exist. Access to registered user profiles is limited to me and emails and opinion polls are private to my account. Moreover, participants' anonymity was preserved in the data analysis by using the social website's usernames. *Facebook* and *Twitter* were used to advertise the site or an upcoming activity simply to increase awareness of the site and encourage other teachers to join. I carefully selected online survey tools such as Zoomerang.com to allow prospective and existing participants a range of options in participation such as: decline the survey and decline receiving further surveys from my email. The issue of some data being public is that it can be accessed, used and analyzed by others without prior consent of the participant however, making certain pages publicly accessible helps to bring visitors to the site and so there is a tension in selecting the number of and the name of the webpages on the site to keep private or public. Photos, email addresses and other personal information were blurred in the captured images from the site to ensure data privacy but participants' profile names were used as these were selected by participants for use on the public website.

3.6.3   Blurring of ownership of User-generated Content

An issue unique to collecting data from the social web is the blurring of ownership of co-authors in a social network site where content is generated by the owner/ moderator/researcher (myself) and others such as other curriculum officers and MOE personnel and teacher participants. Data on the site has been generated by participants and took several forms such as lesson plans, opinions on issues related to practice and technological, pedagogical and content knowledge. Consent to share was sought from participants prior to participation (see Appendix 6).

3.6.4   Data Security

The website www.techtalk.spruz.com is hosted by a publicly accessible *www.spruz.com* platform and is not funded by any external agency or the employer and therefore data or purpose cannot be attributed to anyone other than myself. I am the registered owner of the site and the only one with administration access.

3.6.5   Blurring of Role of Researcher and the Researched

Throughout this study, I had to pay attention to the multiplicity of roles that can happen in a participatory action research study. I was site administrator and a participant. I facilitated online discussions and contributed actively to them. As such many times, my roles as action researcher was complex.

3.7   Data Validity and Reliability

In doing this research, I adopted several ways of ensuring validity, even though Nicholls (2009) argues that reflexivity is more important to the discussion of participatory research than validity. In order to increase validity, I developed criteria and standards, gathered evidence to see if change that is democratic can take place, wrote my thoughts and actions and communicated the 'voices' of teachers in an authentic way. Most of all, I tried to remain critical and reflective throughout the process and adopt ethical procedures.

Data collected from the website is held in its raw and original form on the website, which still exists and can be accessed by http://techtalk.spruz.com. As such, I have used this data in its raw form as evidence of findings for this research. Because the data needed no transcription, this removed the possibility of transcription errors being introduced or paralinguistic features being overlooked, exaggerated or sidelined. Providing screenshots etc allowed the actual digital text to be displayed and analyzed intact. I used a selection of examples from activities on the website for analysis. I used a sufficient number of examples to obtain codes in a progressively iterative process (Perakyla, 2004). Google analytics analyzed all data for the period of the study and general and specific reports are used. I used screenshots of webpages or parts thereof in order to maintain the integrity of the data. Data captured from various activities on the site were used to provide ample evidence of findings and care was taken not to interfere with the data in anyway from how it exists on the site. I did not change the font, grammar, punctuation, order, or any other aspect of the digital text, and as such the font style of the captured data appears different to the body of the rest of this thesis. Photos, videos and hyperlinks were similarly captured and displayed. I argue that this increases the reliability of the data in the study – as opposed to, for example, the transcription of spoken texts.

I have tried to use themes from the literature whose contexts were similar to mine to increase the validity of the analysis of the study. In the next two chapters, I present exhibits of discourse analysis with attention to a great deal of detail. I provide thick descriptions (Gertz,

1973 in Bryman, 2008, p. 387) of activities and individuals as far as possible. This is to provide explanations of the context of the study.

3.8   Summary

I have selected action research methodology as I seek to explore teachers' participation in an online professional social network site. This methodology allows me the freedom to select approaches suited to various aspects of my research. This includes a mixed-method approach to data collection and analysis included social network analysis, discourse analysis and Google Analytics tool. Data collected in this study was captured automatically on the site through threaded discussions in activities such as blogs, discussion forums and live chats. Ensuring that I followed all ethical guidelines, as ascribed by the MOE and the University of Sheffield, was a key area of focus in this research.

4 My Online Professional Social Networking Site for Teachers

In earlier chapters, I introduced online social networking sites, SNS, as websites that promote the formation of social ties (boyd and Ellison, 2007) and distinguished between popular social network sites like Facebook and Twitter and special-purpose SNS like Ning and Spruz. The aim of my study was to explore whether teachers could benefit from participation in an SNS and whether this participation could lead to learning. To investigate this, I customized a social networking site supported by *Spruz*.com and called it *TrinbagoTeachersUsingTechnology*. As with other social network sites, it supported social interactions among members, provided a user profile page and incorporated media-sharing in the form of video, photo and files. I embedded a number of synchronous and asynchronous Web 2.0 tools on it.

4.1 The site www.techtalk.spruz.com

The site is called *TrinbagoTeachersUsingTechnology* and contained 7 main webpages apart from the homepage to allow access to a range of activities. The following screenshot shows the first part of the homepage with access to all other pages.

Figure 4-1 Screenshot of first part of the homepage

The homepage has a number of information pieces about the site and topics related to participation. There are number of summaries of activities within the site such as blog summaries, discussion topic summaries, videos and photos summaries, participants' activity summary, search the site box and opinion polls widgets.

4.2   Selection of Platform

My initial choice for an educational platform to build my site was Ning as this was the most familiar to me. Ning allows a high degree of customization and has been used in educational research before. Educational SNS like these, target specific groups such as teachers and students or educators and enable sites' privacy. This higher degree of customization is favored in education while still maximizing the potential for connectivity and data sharing that SNS are known for (Brady, Holcomb and Smith, 2010). Sometimes referred as the 'walled garden' approach to using SNS in education (Smith and Holcomb, 2009), it allows site administration to control the learning environment of an SNS.

In addition, I had joined Global Educators for All (http://www.globaleducators.org), Teachers Network (http://teachersnetwork.org) and Caribbean Educators Network (http://www.caribbeaneducatorsnetwork.com), both supported on Ning in order to learn more about educational SNS. The specific reasons for choosing *Ning* are affordability, the provision of a collaborative platform and that it was customizable (Thistleton-Martin and Lewis, 2009) while Anderson (2008b) chose *Elgg* for supporting a 'folksonomic' presence in an online course. Studies like these have served to inform my study on using SNS in a teaching/learning environment and its role in supporting learning.

But, at the time of selection, I found out that Ning was not offering a free platform anymore. As any institution or individual did not fund my research, I felt that this choice would become financially burdensome so I investigated other platforms. I explored Edmodo, Mahara, Elgg and Spruz and found that apart from being free, Spruz offered customization features that most closely resembled that of Ning. I addition, it allowed the embedding of a number of interesting tools and features. I found that the management tool was easy to use and online and offline help readily available. The screenshot below shows some options of the "Manage Site' administrative tools available to the site administrator.

Figure 4-2 Manage site tool options

In addition to customization, I also found that Spruz offered site support and online help. Below, in figure 4-3, I show a screenshot of the email that I received from spruz.com after I built the website addressed at http://techtalk.spruz.com.
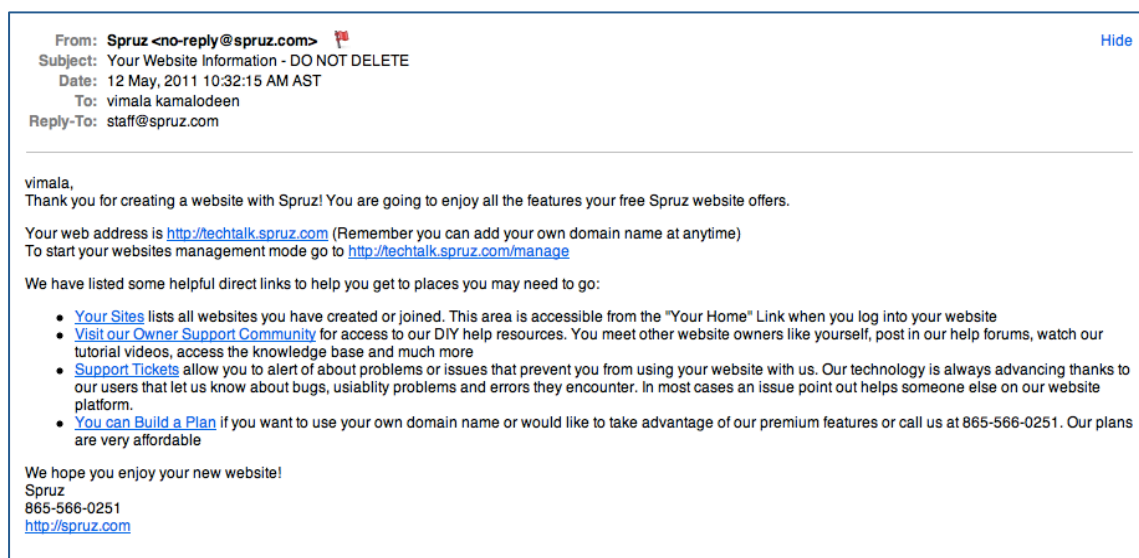
Figure 4-3 Welcome from Spruz when site was created

4.3   Site Design

As I had selected an online social networking site to explore possibilities of teacher learning, I had to customize the site to promote professional relationships and interactions. In order to do this, I customized the site webpages, member settings, activities, content, and site access and privacy.

4.3.1   Webpages

I designed the site to mirror spaces that were familiar to teachers. Apart from the homepage, I customized the names of each of the remaining webpages as: the *Teachers' Lounge*, the *Staffroom*, *Wiki*, the *Classroom*, the *Training Room*, the *Resource Room* and the *Limin' Corner*. The *Teachers' Lounge* allowed access to *members pages*, *blog* and the *events*

calendar, the *Staffroom* allowed access to *Groups*, *Forums* and *Chat* rooms, *Wiki*, the *Classroom* allowed access to upload *videos*, *photos* and *My lessons* pages, the *Training Room* allowed access to different training sessions, the *Resource Room* allowed access to *Sample Lessons* and *Trinbago lesson plans* and the *Limin' Corner* allowed participants to play games, download widgets and other similar activities.

The following map shows the arrangement of the main pages into rooms with names that reflect a school climate.
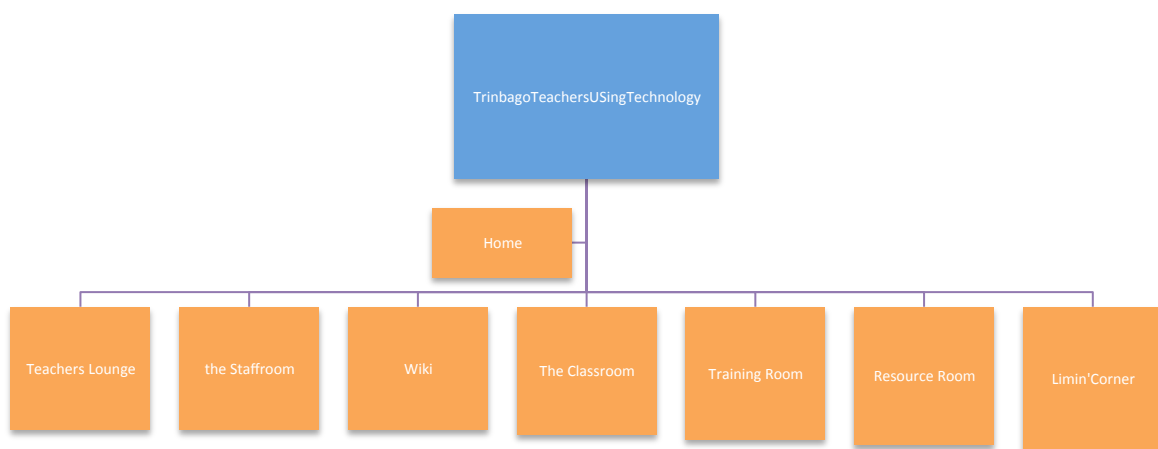
Figure 4-4 Site Map

I selected a colour scheme of blue and orange that reflected an attractive and vibrant Caribbean feel and selected activities and titles that appeared familiar to Trinbago teachers. I kept in mind that social networking technologies –including that of Web 2.0- can be best used for learning if the context is as authentic as possible (Lee and McLoughlin, 2008; Dede, 2008).

4.3.2   New Membership and Registration

Once an invitation has been sent to a potential new member, the person makes a request to join the website. An approval by the site administrator is required (see Figure 4-5 below) and a welcome email is automatically sent (see Figure 4-6 below). Once a profile is created, members could access all pages and activities and add new content and post comments. They could also add other colleagues to their network to get activity updates. Members could have

issued invitations to potential new members as well. In this way, membership was increased both by those that I had invited initially and later on by members themselves. This allowed greater sociability and site ownership by members.
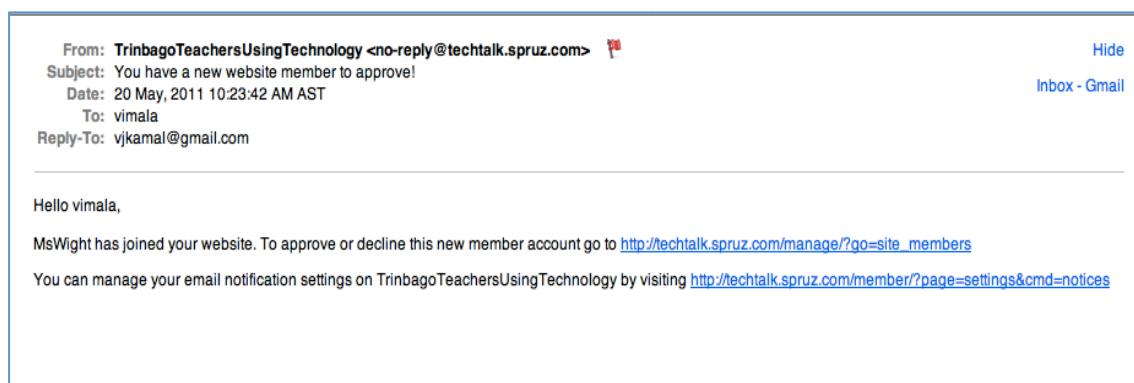
Figure 4-5 Screenshot showing new website membership approval screen
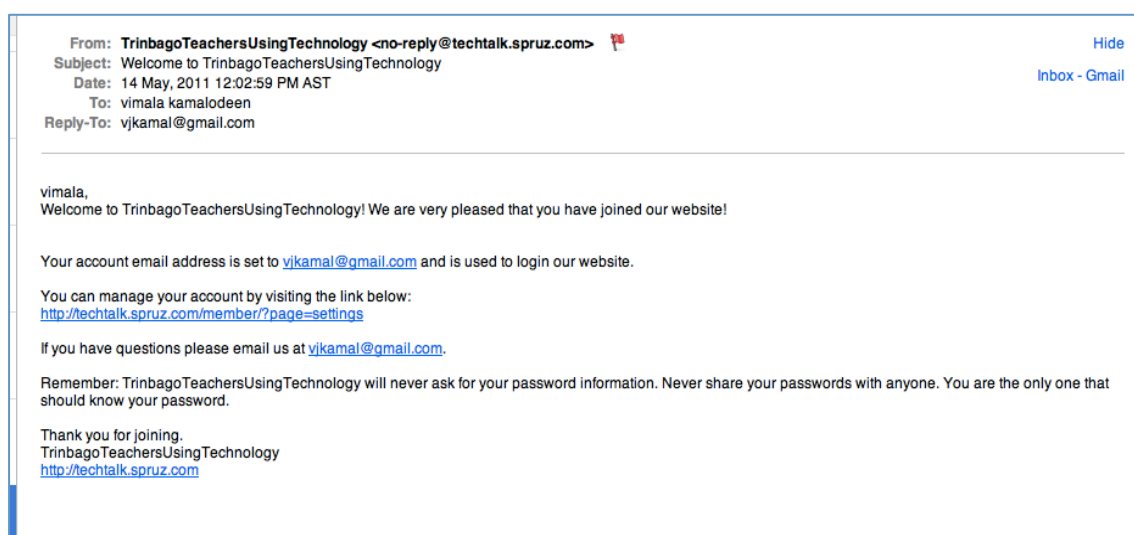
Figure 4-6 Screenshot showing the welcome email to a new member

4.3.3   Selection of content

I selected content to add to the site that was related to integrating technology into the teaching/learning environment. As moderator of the site, I initiated discussions and uploaded content, which I hoped, was of interest to teacher participants. I created lesson plan samples and designed a template to allow for lesson plans to be uploaded online. A listing of files used for *techtalk.spruz.com* is given in Appendix 12. Participants had the option of adding new content or posting comments to existing content.

4.3.4   Dealing with self- presentation

In order for members to 'see' each other, they set up a user profile, which lies at the core of the SNS. I designed the user profile to capture information about the teacher that could reflect

their professional identity. Registration on the site required the creation of this profile, which allowed for the uploading of a profile photo as well as text. Profiles included information about school, location, subject areas taught etc. and added details in an 'About me' section (see Figure 5.3 in Chapter 5 for an example of a completed member profile). I allowed only certain information such as username, photo and location to be made public, as making profile information available is highly sensitive (boyd and Ellison, 2007) and allowed my site to distinguish itself from others. The screenshot below (see Figure 4-7) shows part of the page that allows the customization of member profiles.

In order to emphasize self-presentation as professional teachers, I used the term 'colleague/s' to describe members' friends. 'Friending' is a well-known concept in popular social networks and I sought to distinguish my site from these sites. I had selected Spruz.com for this level of customization and Figure 4-8 below shows how I accomplished this.

Figure 4-7 Member profile page customization

Figure 4-8 Customization of member profile settings

4.3.5   Selection of tools

Synchronous tools are those that occur in real time (chats, wikis), whereas the asynchronous tools are those that occur at different times (e- mails, blogs, forums, online courses etc.). Web 2.0 tools may be distinguished by the delay in response time in an online conversion. Blogs, email, media-sharing and online discussion forums all allow the participant to post replies or start new conversations on their own time while online chats and webinars allow for real-time conversations. While SNS are considered as a Web 2.0 tool in its own right, SNS allow the embedding of most synchronous and asynchronous tools. A number of studies, over the past decade, have focused on using a single Web 2.0 tool with a view to investigate the affordances of that tool in the selected scenario while more recent studies look at grouping one or more of Web 2.0 tools under the umbrella of asynchronous or synchronous tools (Gunawardena, et al., 2009).

Emails were integral to the communication system between site administration and members. They are familiar and easy to use and research suggests email communication advantages the user due to the ease and speed and flexibility for sending files, meeting reminders, and a variety of other types of information (Wainer,Dabbish and Kraut, 2011). *Blogs*, also called weblogs, were one of the first Web 2.0 tools to be used in education. According to Edublog (http://www.edublog.com), some of the best educational uses of blogs are to share material, news, links and more, encourage publication, share media, gather feedback and facilitate

online discussions. I included blogs since research shows considerable use for blogs, or weblogs, in classroom settings and other studies point to advantages in teacher education: individual reflection, fostering online discussions, building learning communities, building digital portfolios and developing a class management system (Lin, 2008; Deng and Yuen, 2011; Loving, Schroeder, Kang, Shimek and Herbert, 2007). Likewise, *online discussion forums*, which organize posts by themes called threads, were incorporated, as they could have advantaged teachers in several ways. These include an ease of responses due to the lack of constraints of time and space (Borko, Whitcomb and Liston, 2009) and allowance of inexperienced in-service teachers to access guidance and mentoring and engagement in a more participatory and collaborative learning environment (Brown and Munger, 2010). Since distance learning evolved into e-learning, there is an abundance of literature on the use of *online courses* for professional development in all areas of professional work including education. As such I decided to create some online courses for members on the site to access and selected content that I thought was relevant to members' interests and allowed interaction among participants(Ostashewski and Reid, 2010; Frey, 2008).

While research supports the inclusion of asynchronous tools because of the potential for flexibility in time and space and opportunities for reflection, critics claim that a "lack of natural social interaction causes "feelings of isolation" among participants" (Wang, 2008, p.59) and that the lack of scheduled interactions can mean that learners fall behind because they do not allocate time for the necessary learning activities (Cheung and Hew, 2010). As such, I considered the inclusion of wikis and online chats. A wiki is an interactive tool that allows for collaboration and I had to create a new page from the homepage to faciliate it. I also incuded online chats and access to Googledocs. Online chats were facilitated offsite through Google chat as the chat feature that was embedded on the site was not woeking well. Through the use of gmail addresses, access was enabled to Google docs for furthering collaborative work.

4.4   Site access and privacy concerns

The website www.techtalk.spruz.com is hosted by a publicly accessible *www.spruz.com* platform and is locatable using any search engine on the Internet. I am the registered owner of the site and the only one with administrative rights. All webpages can be viewed freely but only registered members can add/post comments or upload new content. Teacher participants signed consent forms prior to joining the site to allow for upload of photo, videos etc.

4.5 Usability and Sociability

In designing my website, I noted the emphasis placed on usability and sociability (Preece and Schneiderman, 2009) to promote site participation. My review of the literature suggested that Web 2.0 tools afford users a number of benefits that are both social and cognitive (Selwyn, 2008). The concept of affordances can be distinguished as "real" and "perceived" and it is the "perceived affordances that determine usability" (Norman, 1998 cited in Lee and McLoughlin, 2008, p. 3827). As such I designed a number of different activities, which were enabled by synchronous and asynchronous tools. In Chapter 5, I explore the perceived affordances of these tools. The aim of the inclusion of these tools was to promote participation in site activities, which could afford teachers access to learning opportunities independent of geography, institution and time; allow a shift in control of learning to the teacher and facilitate interactions among teachers who shared a common interest. To increase sociability (Preece and Schneiderman, 2009), I used a familiar design of an SNS, and tried to attract teachers with a similar interest in using technology in the classroom to the site. In phase 2 of my research, I provided links on Facebook and Twitter pages and included familiar Facebook features such as the 'like' and 'Rate it' buttons, horizontal active scroll bars and online chat features. Spruz features member integration with Skysa, a website toolbar that I added to my website and featured apps that worked with my website membership, such as chat room and instant messaging applications (apps) to name a few.

4.6 Summary

I was able to design and launch an online social networking site called *TrinbagoTeachersUsingTechnology* using a platform spruz.com for teachers. I designed the site to attract members and to encourage participation. A combination of asynchronous and synchronous Web 2.0 tools were embedded on the site and the site's content focused on technology integration in schools.

5 Participant Data from the Site and Emerging Themes

This chapter presents an overview of data collected on participants during the study and explores patterns and trends in that data. Specifically, the chapter is organized into five sections, of which the first four presents data on varied aspects of teachers' participation on the site. The data presented in this chapter was automatically captured from the site *TrinbagoTeachersUsingTechnology,* accessed by *www.techtalk.spruz.com,* and from Google Analytics in order to generate themes from the data. Screenshots of website data are used extensively and methods of Social Network Analysis and Discourse Analysis used where appropriate. In section 5.5, themes generated from these data are presented, which are useful in answering the research questions in the next chapter. These themes are synthesized into information that are further analyzed and discussed in detail in Chapter 6. I have described my mixed methods approach to collection and analysis in detail in Chapter 3.

5.1 Exploring Participant data

Invited participants came from Trinidad and Tobago, but over the research period May 18 to August 31, 2011, persons from more than 10 countries visited the site (see Appendix 2 for global map). Global visitors had options to request registration on the site but there were no such requests. Global visits were possible as the site *www.techtalk.spruz.com* is hosted on a publicly available website. A visitor is someone who visits the site with a unique IP address.

Out of 66 invited teachers, 13 sent in consent forms to participate at the beginning of the study. Over the period of the study, 34 participants were registered on the site through setting up user profiles (see appendix 1 for a summary of participant profile data). Some of these participants accepted the email invitations after the study had begun while already registered participants invited others. Registered participants on the site included teachers, middle managers, MOE officials and myself. In this study, the term participant describes registered participant.

According to Google Analytics, 156 different people visited the site with the majority, 93.6%, coming from Trinidad and Tobago. Further, the majority, 77%, of visitors were repeat visitors, implying that one person visited the site more than once. Figure 5-1 below shows visitor summary according to Google Analytics.
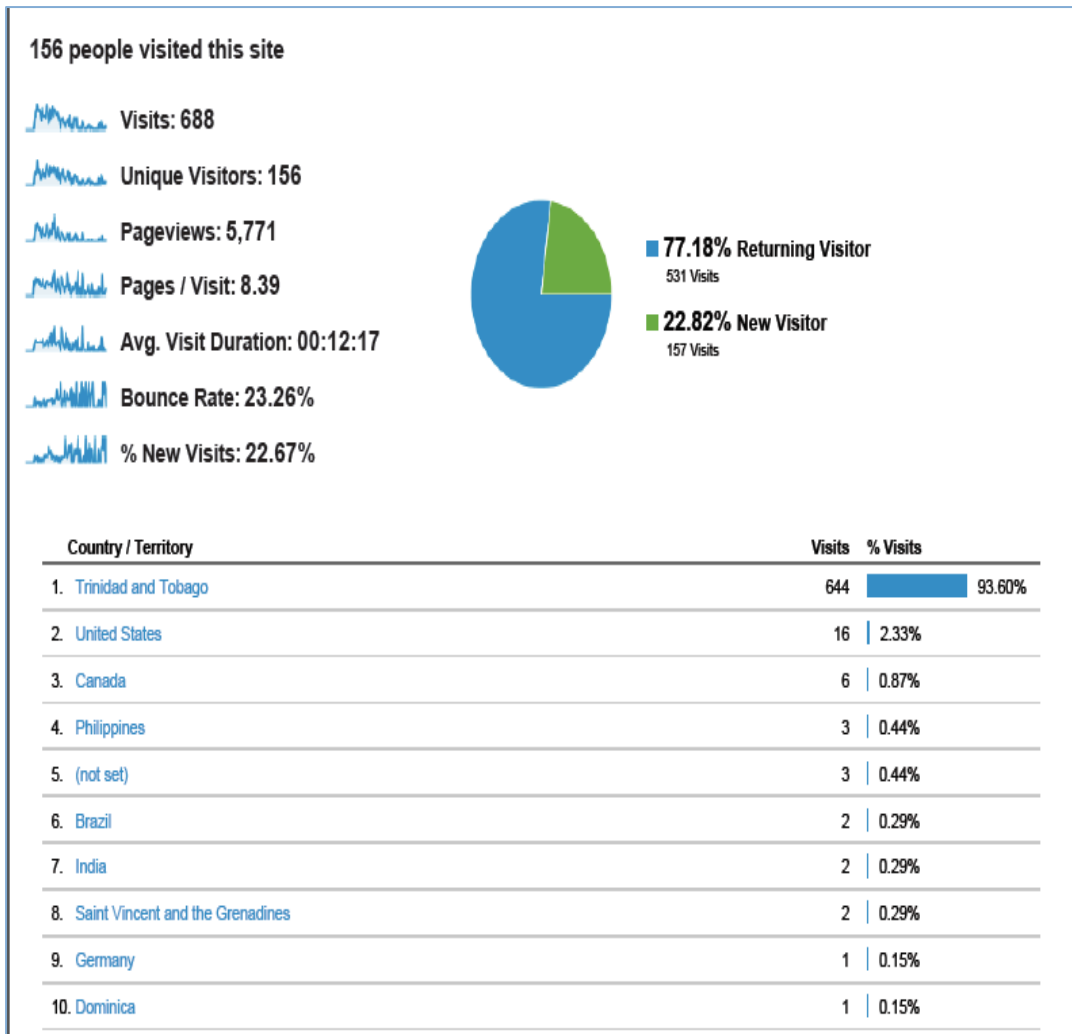
Figure 5-1 Summary of Visitors to Site

5.1.1 Self-Presentation

Participant teachers were asked by the site administration to create a user profile. Profiles revealed that 7 were MOE officers- 5 Curriculum and 2 ICTD officers apart from myself, 26 teachers including Vice-Principals or Heads of Departments and 1 was the supervisor of the project (excluded from analysis). The following screenshot, Figure 5-2, shows part of the Members profile page in the Teachers Lounge. It shows the member's profile photo, location and dates of registration and last visits.
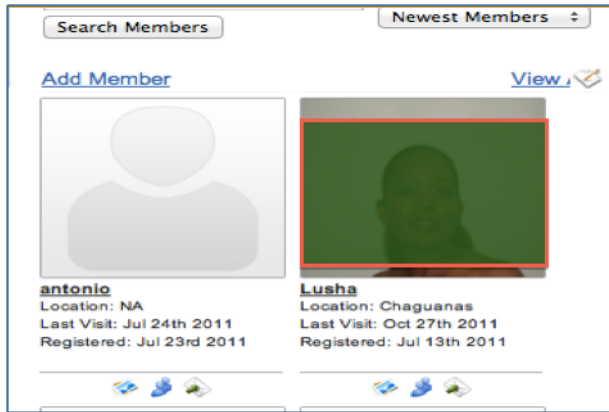
Figure 5-2 Member's profile

Generally all teachers completed the profiles and used their first name as their username. Very few uploaded a profile photo. Examination of the user profiles indicates that participants came from all eight core curricula areas, plus Information Technology. There was a slight predominance of teachers in the Mathematics and IT area with teaching experience ranging from 2 to 26 years. The next example (Figure 5-3) shows a screenshot of a member's completed profile upon registration that can only be accessed only by me.

Figure 5-3 Sample Teacher's Completed Profile

 The choice of username as first name instead of nicknames used in most social media is an indication that teachers were not fearful of revealing themselves on this space. The above two examples indicate that teachers and other participants were quite willing to present their real identities as their usernames and did not change this over the period of participation. These identities were provided with a significant amount of personal and professional information, including the reason for joining the site.

5.1.2   Reasons for Joining the Site

Registered participants indicated one out of four possible reasons for joining the site *TrinbagoTeachersUsingTechnology* and the most popular reason given was 'learning something new'. The least popular reason was to 'show lessons/work'. The other two reasons given were 'sharing my expertise with colleagues' and 'finding colleagues with similar interests'. The chart below presents a comparison of these reasons (see Figure 5-4).
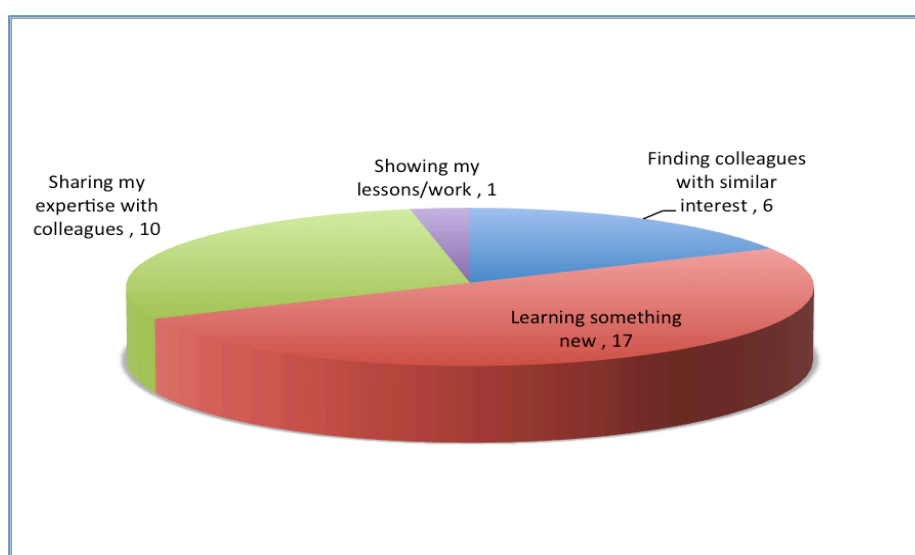
Figure 5-4 Chart of Reasons for Participants to Join the Site

5.1.3   Participation by Location

Trinidad and Tobago registered participants came from all 7 educational districts throughout Trinidad with more teacher located in schools in Central Trinidad followed by South West. Participants from the cities of Port-of-Span and San Fernando accounted for 14% each. More participants came from urban than rural schools. The graph below (Figure 5-5) shows the spread of Trinidad and Tobago participants. The Western side of the country is more heavily populated and the Eastern side less so.
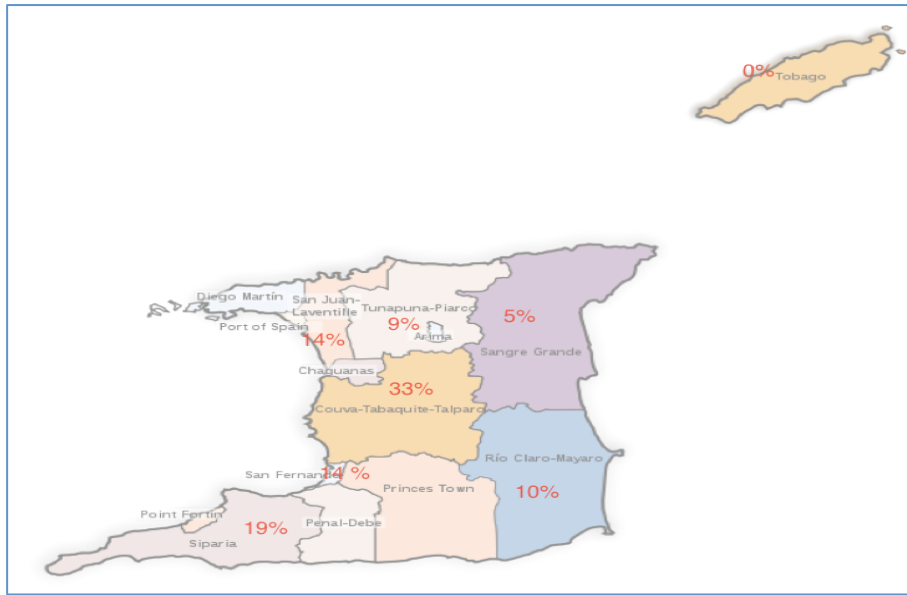
Figure 5-5 Map of Trinidad and Tobago showing location of participants in red

5.1.4 Participation by Age

Ages of all participants including myself ranged from 24 years to 60 years and if MOE
officials are excluded, ages 24 to 51 years. All participants were adults in the teaching
workforce and as such were over age 21. Ages were fairly well distributed across all age
ranges (see Figure 5-6).
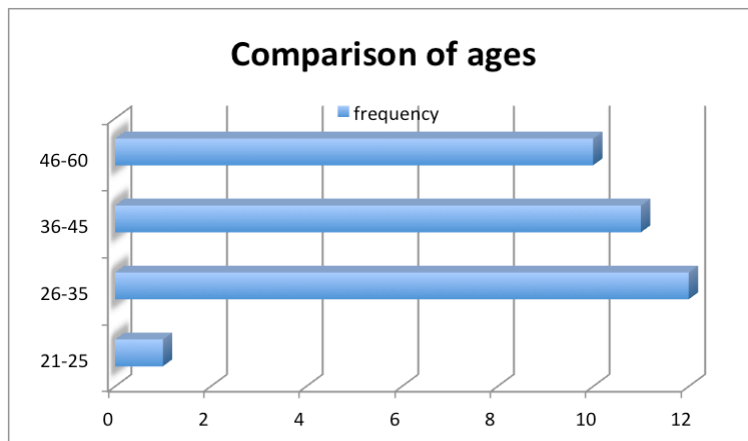
Figure 5-6 Chart comparing ages of participants

5.1.5 Participation by Gender

There were 11 male and 23 female participants.
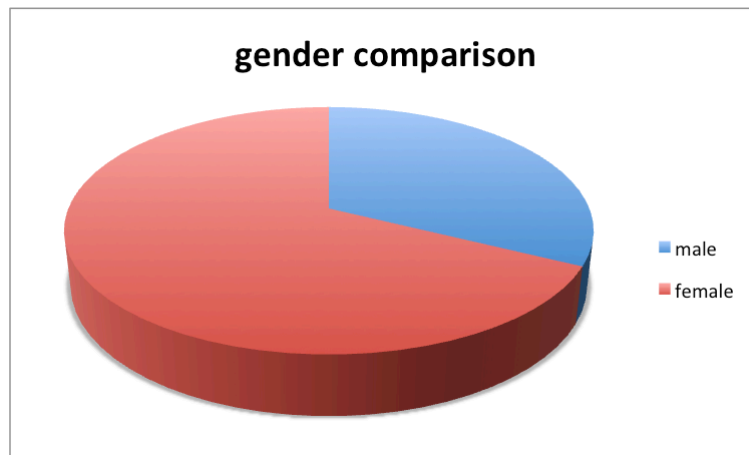
Figure 5-7 Comparison by Gender

5.1.6 Summary of Participant Data

Sixty-six teachers were selected to participate in the research study and 13 initially accepted the invitation. With ongoing reminders, there were a total of 34 registered participants on the site by August 31, 2011. Of these, 7 were MOE officers- 5 Curriculum and 2 ICT officers. The site *techtalk.spruz.com* was hosted on a public platform *spruz.com*, which allows site customization. Google Analytics tool shows that there were 156 unique visitors to the site in that same period with the majority, 77%, being return visitors. This number is higher than the number of registered participants as the site is publicly accessible. Registered participants developed profiles that indicated the reason for joining the site. The most popular reason given was to 'learn something new'. They also uploaded other forms of professional data. Most participants used their real name as their user name but generally, did not choose to upload a profile photo. Visitors came from more than 10 countries but the majority came from Trinidad and Tobago. More participants came from urban schools than rural, were twice as likely to be female than male and was between 24 and 60 years old.

5.2 Exploring Participation Patterns over the Period of Study

In this section, I present data related to trends and patterns in participation over time as well as technology used. The research study was conducted over the period May 18 to August 31,2011 which transcended the third term of the academic year as well as the July-August vacation.

5.2.1 Participation over the Research Period

The following Google Analytics graph shows a summary of participation over the research study period. The graph shows a significantly higher number of visits to the site during the school term versus the school vacation. School vacation took place from July 8 to August 31, 2011. Over this time, participation peaked during May and June and steadily decreased in July and August.
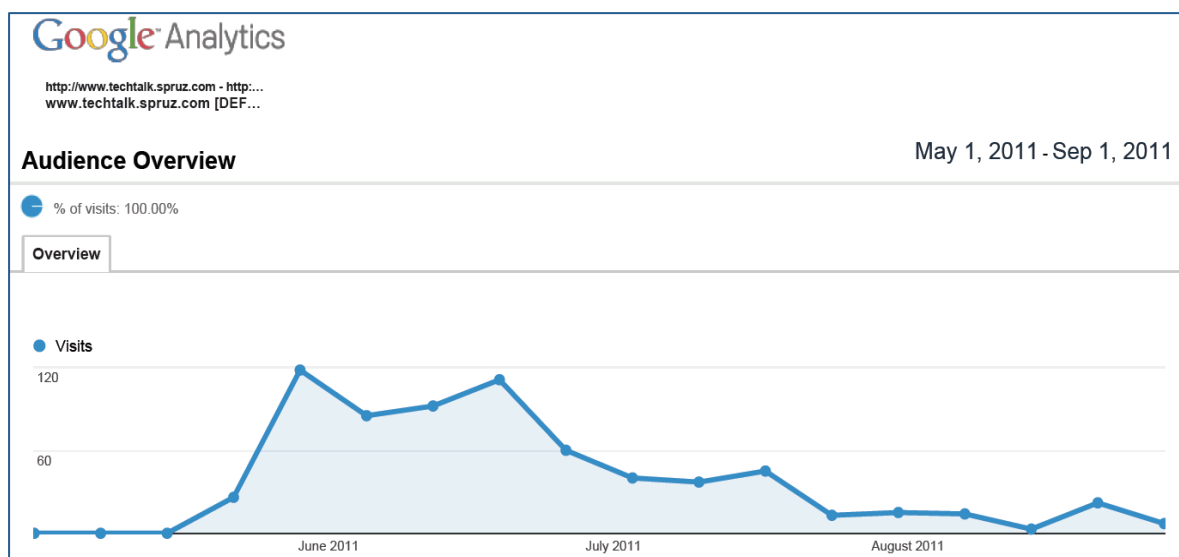
Figure 5-8 Google Analytic graph showing participation over the research period

5.2.2 Time of the Day Selected

The activities that recorded the time of participation were blogs, forum posts and online chats as opposed to opinion polls, media sharing, and adding colleagues. On searching through the data, participants visited the site from as early as 4 am to as late as 2 am. There did not seem to have a specific time but the late evening seemed to be preferable to participants when asked to collaborate on a wiki, Google Doc or online chat. That is, participants seemed to prefer after school hours to visit the site.

5.2.3 Day of the week

After looking at the number of visits over the period May to August, I did not find any day particularly popular over another. I have noticed an increased number of visits on a National public holiday. There were three public holidays during the period May to June , these were May 30th (Indian Arrival Day), June 19th (Labour Day) and June 23rd (Corpus Christi). The following graphs show the trends in visits to the site in the week of each holiday mentioned.
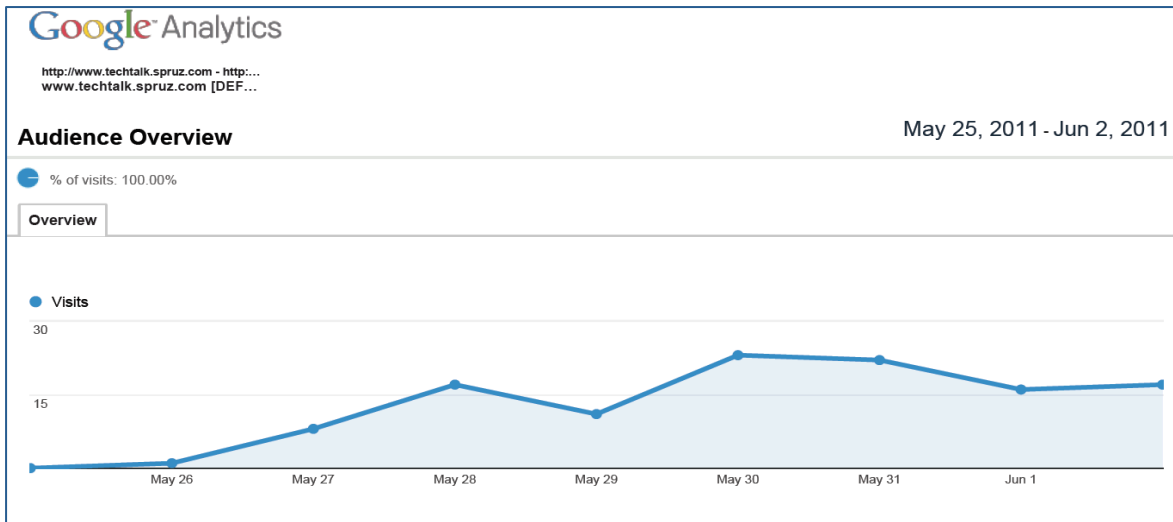
Figure 5-9 Chart showing visitor peak on May 30

In the Figure 5-9 above, participation peaked on May 30. In Figure 5-10, which shows the number of visits from June 18 to Jun 25, there was a peak on June 20, a dip on the next day and then a steady increase until June 24. While the public holiday was June 19, schools got a holiday on Monday June 20 and another on Thursday June 23.
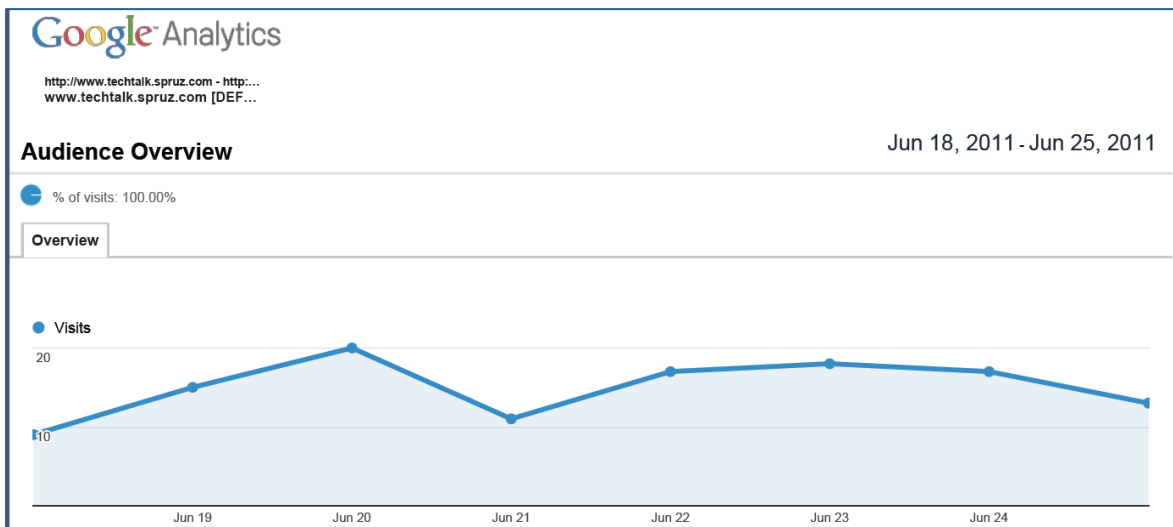
Figure 5-10 Visitor chart from Jun 18 to Jun 25

The next public holiday fell during the July-August vacation on August 1. The following graph, Figure 5-11, shows a different trend in the number of visits on this holiday compared with the three above that occurred during the school term.
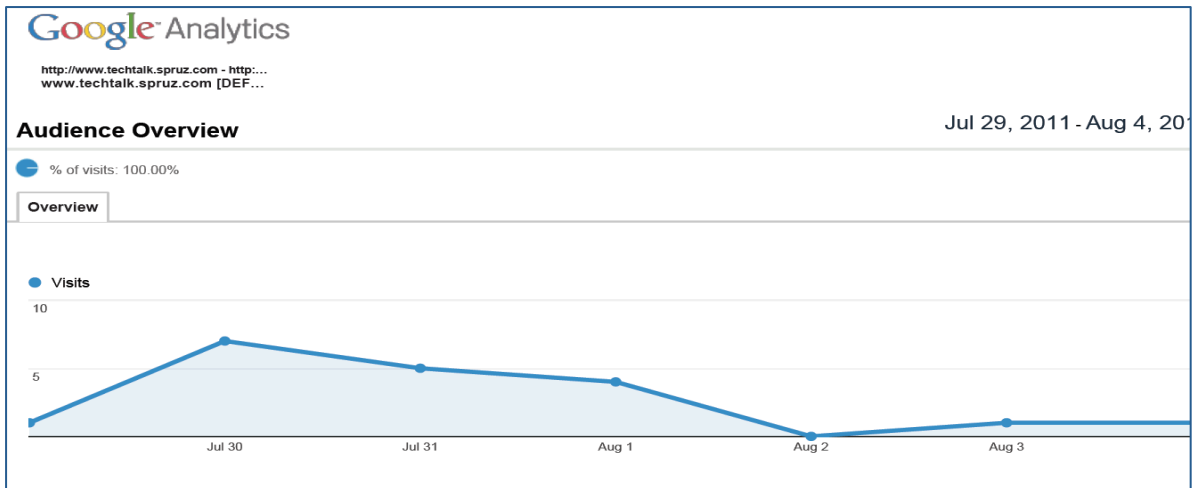
Figure 5-11 Visitor rate from Jul 29 to Aug, 4.

5.2.4 Duration of single site visits

Google analytics indicated that there were 662 visits from persons with IP addresses from Trinidad and Tobago and who spent an average of 12 minutes, 45 seconds on the site during that visit. The bounce rate was calculated to be 21.45% which implies that approximately 4 in 5 visitors stayed on the site after entering and visited an average of 8.66 pages on the site (see Figure 5-1).

5.2.5 Participant Total Length of Time on site

Upon registering, participants stayed between 1 and 161 days excluding myself. The average length of time over which participants visited the site was 38 days. The graph below, Figure 12, summarizes differences in total length of time a participant spent on site from the date of first visit to the date of last visit.
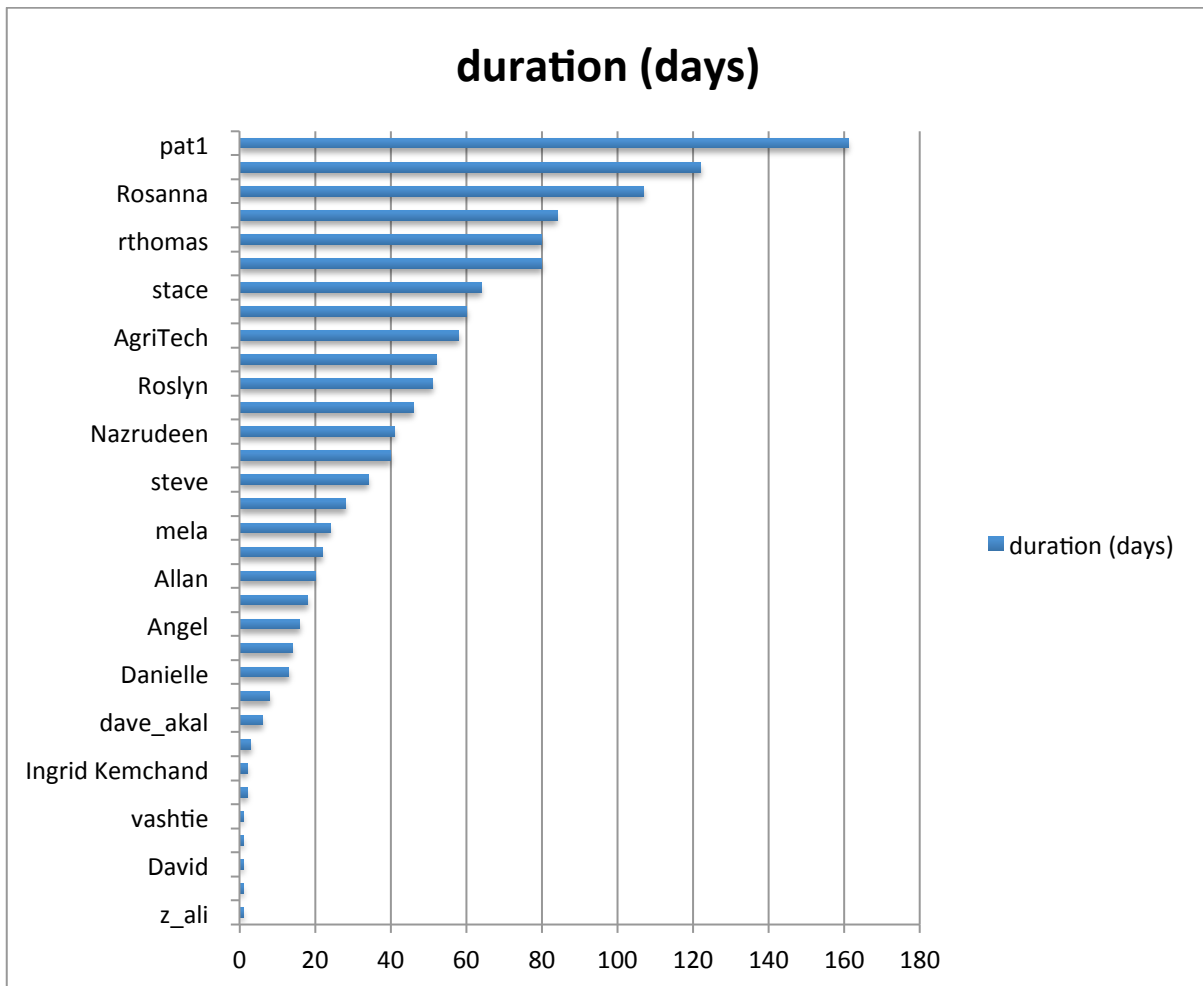
Figure 5-12 Duration of participants (days)

5.2.6 Sources of Traffic to the Site

Visitors to the site came either by entering the site *TrinbagoTeachersUsingTechnology* directly, doing a search such as a Google search or by a referral site such as Facebook, Twitter or email link. The majority of visitors came directly to the site.
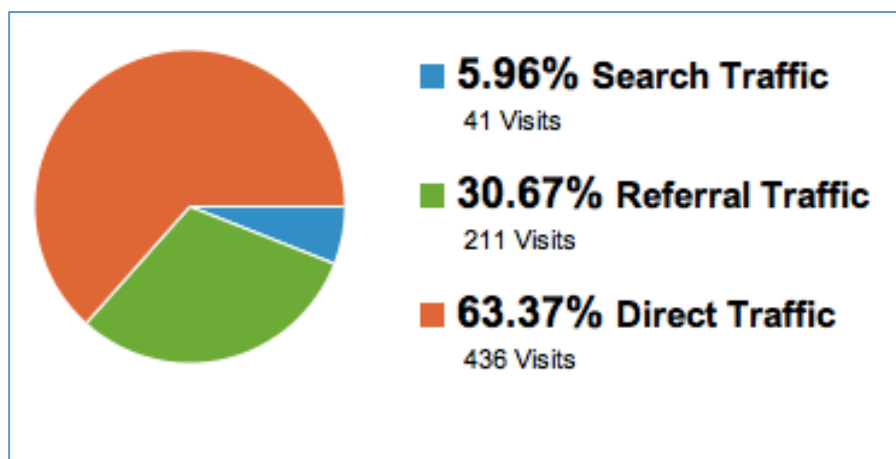
Figure 5-13 Sources of traffic to the site

5.2.7 Technology used to Access Site

The data show that a variety of browsers were used to access the website and Google Chrome and Internet Explorer were the most popular (Figure 5-14). The data also show that Blackberry systems were used which point to the use of mobile technologies as well as standard PC systems to access the website.
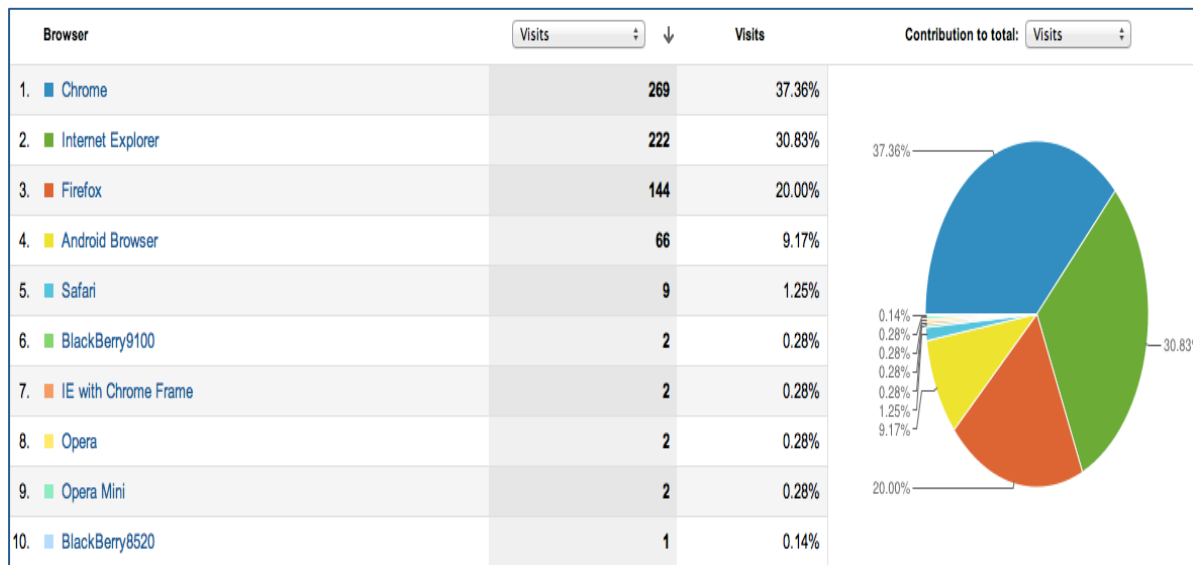
Figure 5-14 Technology used on site

5.2.8 Summary of Participant Patterns

Registered site participants spent an average of 38 days visiting the site over the period May 18 to August 31. Some participants just visited once while others visited repeatedly with more than 75% being repeat visitors. There were 688 visits to the site during the research study period, with visitors staying more than 12 minutes on the site on average and viewing more than 8 pages in that visit. Teachers preferred to visit the site during non-school hours and there was no particular day of the week that was preferred except the number of visits to the site increased significantly during a public holiday during the term. Teachers had greater participation during the school term than during the vacation period. Visitors used a variety of known browsers such as Google Chrome and Internet Explorer to enter the site but also used tablet and mobile phone browsers including Blackberry. Most visitors accessed the site directly while others accessed it by doing a search or came through a referral site such as Facebook or Twitter.

5.3   Exploring Participation through Embedded Web 2.0 Tools

The site allowed a number of activities for teachers to select for participation afforded through various Web 2.0 tools embedded on the site. Asynchronous activities included media sharing of lesson plan files, videos, photos; *blogs*; discussion forums; creating a user profile; adding colleagues; creating groups; engaging in games; downloading widgets; clicking 'like' buttons; emails; signing on to an online course; taking an opinion poll. Synchronous activities are *wikis*, *online chat* and *Google docs,* the latter being facilitated offsite. Most activities can be viewed without logging on, however, the user must be logged on to add content to the site. Activities that did not require logging on are clicking the 'like' button, downloading widgets and taking opinion polls. Useful information is therefore gleaned from looking at activities that require a participant to be logged in and show usernames. In order to explore participation patterns further, I looked at participation by activity facilitated by different Web 2.0 tools. In this section, I present data showing participation in activities facilitated by synchronous and asynchronous Web 2.0 tools.

5.3.1   Synchronous Web 2.0 Tools

Synchronous activities allowed more than one user to participate in a selected activity at once. Examples of these are wikis, *Google* chats and *Google* docs. The wiki was facilitated online and on the site. However *Google* docs and *Google* chats were facilitated offsite using a *Gmail* address. I use screenshots to present examples of each activity.

5.3.1.1 Wiki

Wikis have two states, read and edit. Wikis are in read state by default. Read state means that the wiki page looks just like a normal webpage, but when the user wants to edit the wiki page, they must access the wikis edit state. There were 5 wikis published on the site, of which one was created by Yemi-J called 'What're are your favourite tools to integrate technology?' This participant also worked with me on the TPACK wiki. The following screenshot, Figure 5-15, shows summary data about each wiki such as the author, wiki title and published date.

Figure 5-15 Screenshot of wiki page

5.3.1.2 *Google Docs*

In addition to wikis, Google docs was facilitated through a Gmail account where times to collaborate were agreed to prior to the event. Google docs is a suite of products hosted free on the Google platform and allows for participants to create all types of online documents in real-time. The next screenshot, Figure 5-16, shows the Google doc presentation being worked on collaboratively between Yemi-J and me. The name of the Google doc is 'TPACK Games' and the slide shown is slide 4 of 7 being created.
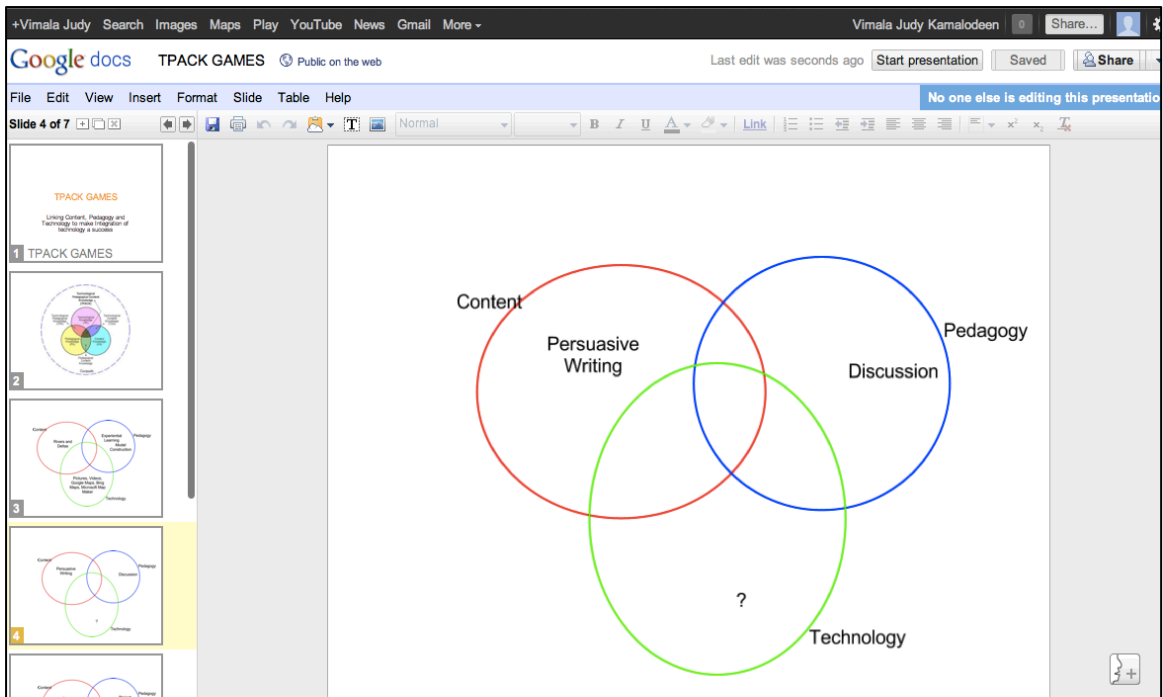
Figure 5-16 Screenshot of a Google Doc collaboration

5.3.1.3 Online Chats

In the next screenshot, Figure 5-17, I highlight a number of chats with myself and other participants. The starred chats are significant which are also highlighted in yellow for ease of reference. The screenshot shows the date of the chat, the email of the invited person, and the first line of the conversation and the length of the chat.

Figure 5-17 Chat history via Google chat

This screenshot shows online chats that are with two participants in the research study, which were 76, 1 and 17 lines long and 1 and 43 lines long respectively. The 1-line long chat indicates that I invited a participant to chat but there was no response. *mizlezama* attempted to participate in the chat but had significant difficulty with the technology and had to be terminated.

5.3.2   Asynchronous Web 2.0 Tools

Asynchronous activities were found throughout the site in multiple webpages. Forums were found in the Staffroom together with Groups and Chat pages. Blogs were found in the Teachers Lounge with Events and Members pages. Videos, Photos and My Lessons were found under Classroom page. The Training Room facilitated subscription to a number of online courses, some held on that page, others hosted through a free online course website, *Udemy.com*. Files in different formats could be uploaded and downloaded in the Sample Lessons page under the Resource Room page.

In contrast to participation in synchronous activities, participation was significantly greater in activities facilitated through asynchronous tools. There were 14 different blog posts, 3 video uploads, 11 photos uploaded and 53 email responses. In addition to the lesson plans that I had uploaded, a participant uploaded 4 of her own, which received a number of downloads as well. There were 6 threaded discussions in forums in three curricula areas and ICT. There were 9 different participants in all these activities except myself, with one participant dominating in all activities. In addition, I prepared 3 online courses with 31, 60 and 3 subscribers respectively. There were 53 emails as replies from participants acknowledging request to be added as colleague or if a new colleague was registered on the site. Gmail was used together with the site's email to provide notifications about activity on the site. There were also 7 online surveys hosted on *Zoomerang.com* and a number of daily site polls. Newly registered participants who I had asked to be my colleague on the site sent these emails to me. Participants did not create any groups or events. I used the Events page to highlight upcoming collaborative events.

In this section, I present screenshots showing participation in 12 different Asynchronous web 2.0 tools.

5.3.2.1 Video uploads

The next screenshot, Figure 5-18, shows the webpage for Videos, found under the Classroom page. Two videos were related to Curriculum while one was related to Technology. Three different participants uploaded these videos.

Figure 5-18 Video history

5.3.2.2 Photos upload

The left side of the next screenshot, in Figure 5-19, shows how photos were easily added to the site while the right side shows samples of photos uploaded. Photos were available under the Classroom page. The screenshot below shows a few of the photos uploaded by participants. All photos uploaded related to the teachers' content or pedagogy.
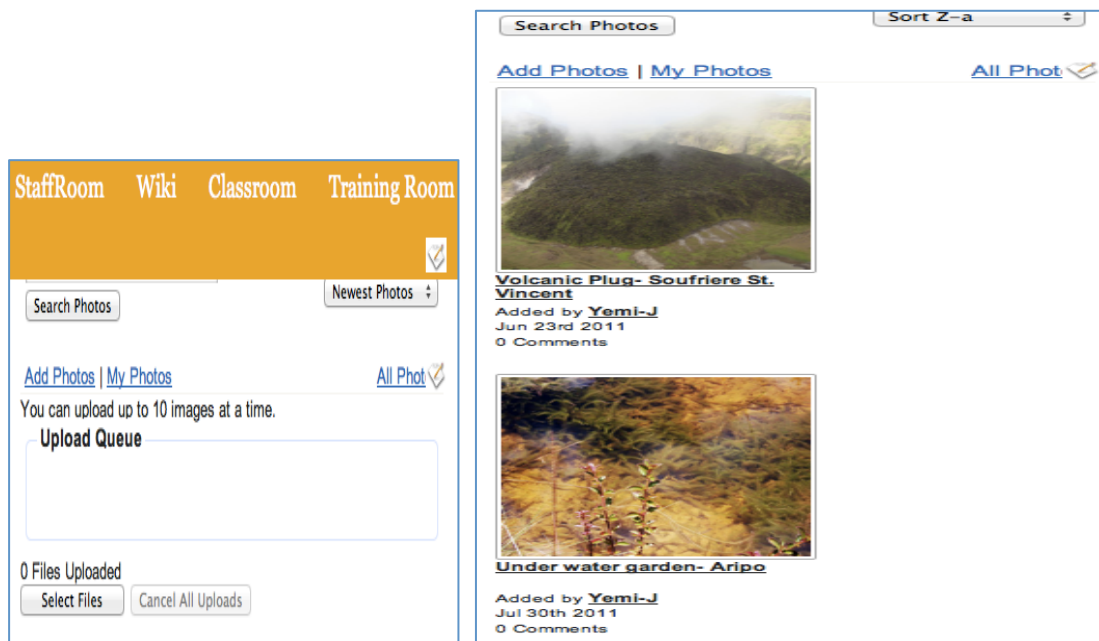
Figure 5-19 Photo upload page and samples

5.3.2.3 Lesson Upload Using Template

In contrast, participants did not use the lesson plan template that I had created and uploaded to facilitate lesson plans. The next two screenshots in Figure 5-20, below show part of the template called Trinbago Lesson Plan Template, located in the 'My Lessons' page under Classroom, and a sample lesson shown in the Trinbago Lesson Plans page in the Resource Room.

Figure 5-20 Screenshots of Lesson Plan template and a sample lesson

5.3.2.4 File upload and download

Participants did choose to upload and download created lessons in their own formats using the Sample Lessons page in the Resource Room. Participants were allowed to add a file, view files and download. Figure 5-21 below, shows a screenshot of sample files in the Sample Lessons page.

Figure 5-21 Sample lesson File Uploads

5.3.2.5 Online courses

This screenshot, Figure 5-22, shows the online courses that I developed for participants, hosted on a free online course website Udemy.com. The courses were Google docs, Lesson Planning and Differentiated Classrooms and had 31, 60 and 3 subscribers respectively.

Figure 5-22 online courses available to participants via Udemy.com

5.3.2.6 Forums

In the next screenshot, figure 5-23, I show the forum categories by Curricula area and Technology so that participants could have entered a particular forum depending on the topic of interest. The screenshot shows low participation in the Forum with threads in 3 subject areas under Curriculum but significantly higher levels of participation in one thread in Technology.

There was one more forum category called pedagogy but no threads were created under it so it was empty. The next screenshot shows this.

Figure 5-23 Screenshots of Discussion forums

5.3.2.7 Blogs

Blogs allow for discussions threads to be categorized upon creation and threaded when new content is added. The blog page is found in the StaffLounge and allowed for a wide range of digital content to be uploaded.

The next screenshot, Figure 5-24, shows part of the home blog page, which illustrates the last blog entry, made to the site on the left and a summary of blog posts under six categories. 14 postings were done in 6 different categories. Summaries of blog postings are highlighted on the homepage. Details of the postings will be done in the next subsection.

Figure 5-24 Sample blog

5.3.2.8 Emails

Emails were sent by participants in response to colleague requests or if a new participant registered on the site. There were 53 emails. The next screenshot show sample emails (see Figure 5-25).

Figure 5-25 Email history

Email notifications were also set up on my account to alert me to various activities on the site *TrinbagoTeachersUsingTechnology* such as the registration of a new member. The screenshots below shows mails in my *Gmail* inbox that notified me when a new member joined the site, when a participant sent a message to a colleague or new comments were posted to a discussion topic or forum post.

I have selected three screenshots to illustrate these (see figures 5-26 and 5-27).
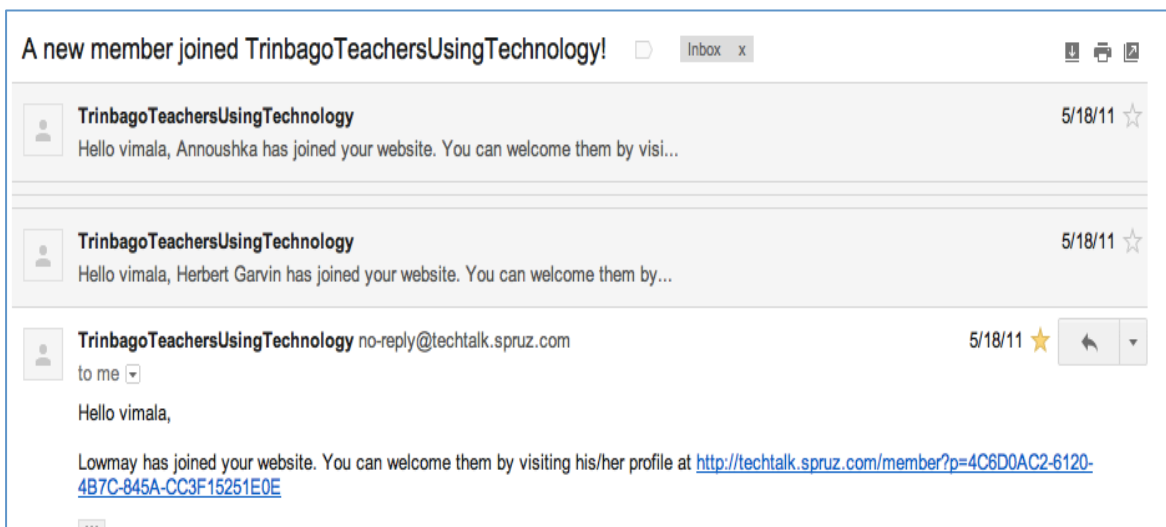
Figure 5-26 Email announcing new member joining site

You have a new message   Inbox x

TrinbagoTeachersUsingTechnology no-reply@techtalk.spruz.com   5/22/11
to me

Hello vimala,

stace sent you a message, here is a preview:

To view your messages go to http://techtalk.spruz.com/member/?page=mail

You can manage your email notification settings on TrinbagoTeachersUsingTechnology by visiting http://techtalk.spruz.com/member/?page=settings&cmd=notices

New reply to (Internet Access for Form 1 students)   Inbox x

TrinbagoTeachersUsingTechnology no-reply@techtalk.spruz.com   5/28/11
to me

vimala,

MsWight has posted a reply to Internet Access for Form 1 students.

In response to the "Internet Access in Schools" pdf... Though it may be politically correct to say secondary schools have Internet Access, most of this would have taken place during the SEMP initiative. Atmy school we are still operating on the initial WIFI setup... NO WIFI EXPANSION has...

You can change your subscription options to this topic by going to the topic and click on unsubscribe.

Figure 5-27 Sample Email notifications

5.3.2.9 Online Polls and Surveys

A number of online polls and surveys were created to gauge participant opinion on a range of issues related to technology, pedagogy and content/curriculum. Visitors to the site could have opted to participate in daily site polls and the next screenshot shows a sample of them. Polls were created weekly. One of these selected polls (see screenshot below in Figure 5-28) shows that only 4 persons participated and what their responses were. These results were displayed

onsite when the poll closed at the end of the week.
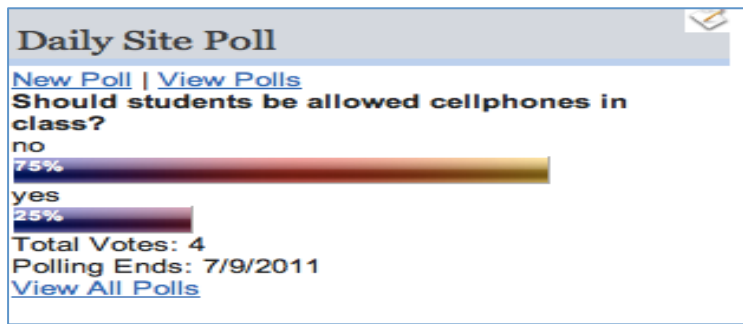
Figure 5-28 daily site poll sample

The next screenshot (Figure 5-29) shows a number of online surveys hosted on Survey Monkey, a free online survey tool. Surveys initially created on another similar site, Zoomerang.com, have been migrated to SurveyMonkey.com as they took ownership of the site. Surveys were sent out via email to site participants and invited teachers depending on the nature of the survey. The Survey Monkey! screenshot below shows the responses for each survey, which varies from 3 to 18 responses. Generally poll responses were varied.

Figure 5-29 online survey

5.3.2.10 Groups

There is a facility on site that is common to many social network sites that allows for users to create their own groups. This facility was located in the staffroom. No groups were created on site and the screenshot below illustrates this (Figure 5-30).

Figure 5-30 Groups

5.3.2.11 Events

The Events page shows a current calendar and highlights upcoming events on the site. It also shows the profile picture of the creator of the event, the title and date as well as participation status updates. The screenshot below shows details of an event, created by me, that took place on Saturday June 18, 2011. It indicates that 4 members had joined in (Figure 5-31).

Figure 5-31 Event calendar

The next screenshot shows a listing of events that participants were invited to on the site (Figure 5-32)
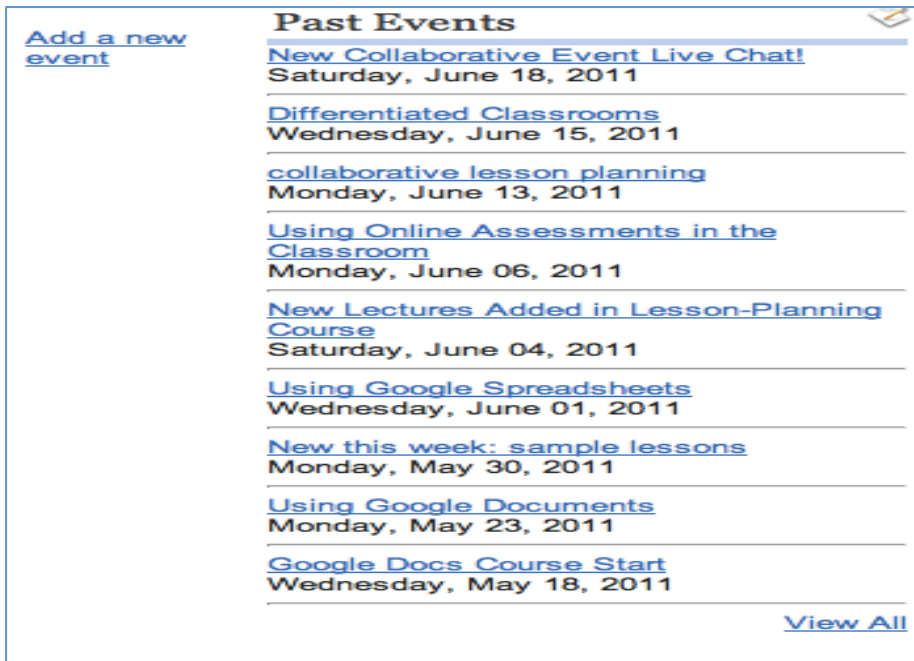
Figure 5-32 Event history

5.3.2.12 Widgets

The site allowed for a number of downloadable widgets which I placed in the Limin' Corner page as well as on the Home page, however there was no record of participation. The screenshot below shows a sample of two widgets (figure 5-33).
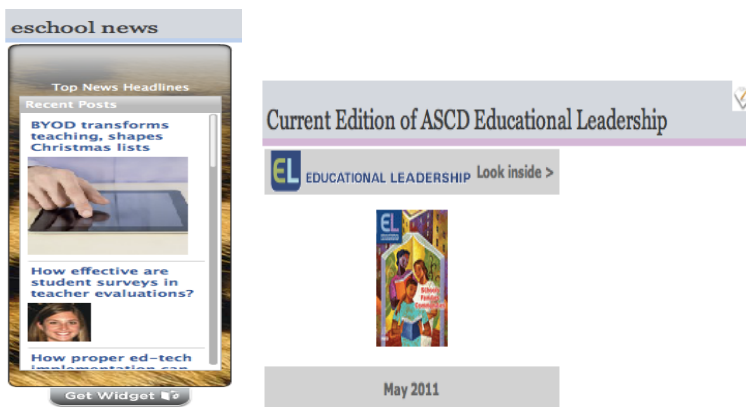
Figure 5-33 widgets available on site

5.3.3 Summary of Participation through Web 2.0 tools

There seemed to be active participation in most site activities, whether facilitated by synchronous or asynchronous tools. Activities facilitated by asynchronous tools seemed to have higher levels of participation both by the number of participants and the number of contributions made to the site. There were 14 different blog posts in 6 categories, 3 video

uploads, 11 photos uploads, 4 uploaded lesson plans and several downloads in selected lessons, 6 threaded discussions in Forums in three Curriculum areas and ICT and 3 online courses developed with 31, 60 and 3 subscribers in respectively. The events calendar was useful in alerting participants about upcoming activities. There was no evidence of participation in 'groups' or in using the online lesson-planning template.

Participation in synchronous activities was significantly lower than that for asynchronous activities, with one participant able to take part successfully in all three activities. There were 5 wikis and 1 Google doc created as well as a number of online chats. Online chats facilitated real-time conversations and was enabled through *Google chat* with *Gmail* addresses. Chats were more successful than other synchronous activities like *Google docs* and *wikis*. Participants selected the type of activity as well as how and when they wanted to participate.

5.4   Exploring Participation in Site Activities

In the last section, I listed a range of site activities facilitated by embedded synchronous and asynchronous Web 2.0 tools. Some site activities allow for a history of participation activity, which allows participant details to be recorded automatically. In this section, I present findings from selected samples of site activities. Samples were selected across different Web 2.0 tools in order to determine how participation in that activity could potentially benefit the participant. The following 11 activities were explored: file sharing, blog postings, enrolling in an online course, taking part in an opinion poll, forum postings, adding new colleagues, signing in and participating in an online chat, creating a user profile, creating/editing content on a wiki, and media sharing and Google docs collaboration.
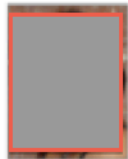
5.4.1 Activity: Lesson Plan File Sharing

In the Resource Room, participants have an opportunity to upload and download lesson plan files. The image below shows that Annoushka uploaded a lesson plan file by clicking the 'add file' option. The site data shows the date of upload lesson plan 'Introduction to MS Word' under the tag Technology Education, the number of downloads and file editing options. Adding a file implies adding content to the site, which in turn allows the participant the opportunity to share knowledge. The activity of file download implies that participants consumed content and was performed by someone seeking knowledge of lesson plans. The

screenshot below shows the items of data that led to potential benefits of knowledge seeking and knowledge sharing, two aspects of knowledge building.

5.4.2 Activity: Blog Posting

The next activity shows the adding of content in a new blog post by Lusha under the category 'my lessons' followed by an added comment to the post by Yemi-J. It seems as though Lusha wanted to reach out and connect with other colleagues with a title 'My first google docs document' and introduced her thoughts. There were 21 views of this post. In this blogpost, I analyzed the discourse and noticed there were several aspects to the post. In the introductory paragraph, Lusha talked about a plan she has for her Form Ones, which indicates she is reflecting on her practice. In the second paragraph, she explored her plan and continued to reflect on her practice. In the third paragraph, Lusha shared an opinion on Google Docs, then proceeded to share details of the plan with a hyperlink. Thus she was sharing a piece of knowledge that she had on the topic. She concluded the post by saying 'I welcome your comments' which suggests that she was actively seeking the opinions of her colleagues. In the posted comment, Yemi-J started off using "I think this is a great idea!..." indicating her willingness to give Lusha emotional support to her post. She continued the post by giving her opinion on Lusha's plan.

Blog Entries

Add Entry   View A

My first Google Docs Document
Posted by Lusha Jul 21st 2011
Category: my lessons

Options: Edit Delete Feature Views: 21

Connect with colleagues

Last night I started working on a Music Project I have had in mind for my Form Ones. (I think I will try it with the Form Twos for the new school year as they should all be more familiar with their laptops.)

Reflection on practice

I plan to give each child a printed copy of the interview questionnaire, however THE PROJECT MUST BE SUBMITTED ON-LINE. The idea is that even if they do not have internet access at home they would use the school library computer to submit project. (I know this will take a lot of work on my part making sure the projects are actually done, I am looking forward to the challenge.)

Exploring ideas

I was looking at all the different things you can do with Google Docs and was particularly interested in the fact that it enabled me to do a template for an interview idea I have had for a while. What I particularly like is that Google Docs can do a summary of all projects submitted.

Opinion sharing

The Proposed Project: To interview a grandparent, parent or guardian about the type of music they listened to when they were your age.

Knowledge sharing

Please follow the link to view proposed Project Questionnaire.

https://spreadsheets.google.com/spreadsheet/viewform?hl=en_US&formkey=dG0yck9rMzVUQlZiQ1ZPNlU5Ed05CZHc6MQ#gid=0

I welcome comments.

Opinion seeking

Tweet 0   Like 0

Connect with colleagues

Yemi-J (Jul 30th 11)   Reply / Delete

I think this is a great idea! Gets students to learn about different types genres of music.

Emotional support

I do have a suggestion for the planning- to ensure fairness to all students you should have scheduled time within the project for the students to access the school computers. It doesn't have to be your class time necessarily, it can be a library period, or 20 mins from a home room session; and depending on how many computers are available, you can always divide them into smaller groups, so group A has 20 mins today, group B has 20 mis tomorrow etc. And any additional time they require they can arrange themselves.

Opinion sharing

Rate

5.4.3 Activity: Online course enrollment

Participants enrolled in available online courses listed in the Training Room. Courses are hosted on *udemy.com*, a free online course platform where I built three courses, Google docs, Lesson Planning and Differentiated Classrooms. These courses address current topics in professional development for teachers and while initially set to private, are now publicly accessible on the web. The number of enrolled participants is indicated in the image below. Participants seeking knowledge on these topics can benefit from enrollment. The course platform allowed the facilitator to engage participants by sending messages or tasks. Students could connect with colleagues by sharing opinions on the course.

5.4.4   Activity: Forum Discussion

Angel started a new topic under the forum category 'technology'. The forum is different from a blog tool as it allows a number of queries/ comments to be posted to a moderator for that section under pre-created categories. The Forum page has a Curriculum, Technology and Pedagogy category with a moderator for each section. In this topic, there are 8 replies but I have included one set of comments by MsWight in order to complete the analysis. The forum allowed the participants to 'talk' with others on the topic of concern. In the first line, Angel expressed a concern as she reflected on her practice, shared some knowledge about the topic that she learnt in school and sought to share this concern with her colleagues and seek knowledge about this concern from them. In a response, her colleague shared her feelings on the topic with "Same here!" to give emotional support and continued to add new information to the topic as well as her opinion "I see no indication that it is still a thought".

5.4.5 Activity: Participate in an online chat

The chatroom was located in the staffroom but did not allow for automated transcripts so I used Google chat instead. The following conversation took place between Yemi-J and myself. The example below is part of that chat and allows synchronous talk to take place. By responding to the salutation with 'hello" allows connections to be made with another colleague. Further along the conversation, Yemi-J reflected on her practice by saying " I haven't put much on it (her wiki) now, I am reconceptualising.." and 'tags are important". She offers emotional support with "lol hey we all need a break".

5.4.6 Activity: Create a user profile

Participants are requested to create a user profile upon registration, which can only be accessed by me. There are several categories to complete. This example shows a comprehensive profile where the participant used her first (real) name as her username, her photo, and why she chose to participate on the site. The profile shows how the participant identifies herself professionally. This suggests that she wishes to connect with other colleagues professionally.

5.4.7 Activity: Add a new colleague

As part of site activities, participants can add a colleague so that they can see updates of their posts and activities. In this activity, Lusha added Yemi-J as a colleague on 30/7/2011. This activity allows participants to expand their network of colleagues and remain connected.

5.4.8 Activity: Collaborate on a wiki

Wikis are synchronous tools that allow more than one person to collaborate on the same document. As such it allows participants to connect together in a shared activity simultaneously. It can also be edited over time. Wikis have two states, read and edit. Wikis are in read state by default. Read state means that the wiki page looks just like a normal webpage, but when the user wants to edit the wiki page, they must access the wikis edit state. The following example shows a collaborative effort between Yemi-J and Vimala through a snapshot of the history of the creation of the wiki, which shows respective contributors and the particular item shared. As such, both authors create content and knowledge is shared.

5.4.9 Activity: Taking part in an opinion poll

This snapshot below shows the results of one of several online opinion polls created on the site. The site allows for a number of polls to be created, shared and analyzed. This poll on laptop use had 3 votes.

Daily Site Poll New Poll | View Polls **Are laptops in schools beneficial to students?** yes **100%** Total Votes: 3 Polling Ends: 5/24/2011 View All Polls	Opinion sharing

5.4.10 Activity: Media Sharing

In the Classroom, participants can upload videos, photos, and lessons. I have chosen a video and a photo to illustrate what types of media participants chose to upload.

In the first example, Derek Haqq uploaded a video called 'PowerPoint for training and education-a semi dramatic approach'. There were 53 views and 1 comment. This shows other colleagues were looking at the activity and seeking some information on it, while the author sought to connect with other colleagues. He shared his knowledge on the video by adding detailed comments and background information " This is a just a simple example of how you can…". He invited colleagues and to comment by sharing their opinions " hopefully the more creative of you out there will appreciate the idea" and to engage in further knowledge sharing "come up with some better examples". He also reflected on his practice " the sound is a little off".

In the second example, Yemi-J uploaded a photo of her students doing a class activity entitled 'Students working on a Geography lesson on the Form1 laptops'. It was photo 3 out of 4 of a collection called 'Students PBL work'. It was the only photo that attracted comments, which I have also included below the photo. While Yemi-J did not add comments to the photo initially, this form of digital text conveys messages that can be analyzed. The photo allowed the contributor to share what she was doing in her classroom as she reflected on her practice as well. It can be interpreted as a way of connecting with her colleagues through showing what her students were doing in the classroom.

Knowledge seeking

Knowledge sharing

Reflect on practice

Opinion seeking

Connect with colleagues

Photo 3 of 4 in "Students PBL Work" Collection   Previous Next   Knowledge sharing

Reflection on practice
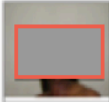
Students working on a Geography lesson on the Form 1 laptops
Added by Yemi-J on Saturday, July 30, 2011
Options: Edit Delete Feature   Rate ▬ 0 ✚   connect with colleagues
Tweet 0   Like 0

Lusha (Jul 31st 11)   Reply / Delete

Yemi-J

I really really liked these pictures you added. The whole collection, but this one is my favourite.   Opinion sharing

You actually have me anxious to go back to school so I could start taking pics of my kids at work.   Explore new ideas

Rate ▬ 0 ✚

Yemi-J (Jul 31st 11)   Delete
:) Well that's great! :)   Emotional support

I took these last term. We are trying to implement the use of the laptops on a phase basis since we lack the electrical capacity and space to do it immediately.   Reflection on practice

So here, we are using a pair and share method.   Knowledge sharing

Rate ▬ 0 ✚

5.4.11 Activity: Google Doc collaboration

Google Docs are free online tools that allow documents, spreadsheets and presentations to be worked on collaboratively among a number of users. The following Google presentation, TPACK, was worked on collaboratively with Yemi-J and me. She added content to the slides related to her curriculum area, Geography, while I was creating the presentation. There were a total of 7 slides.
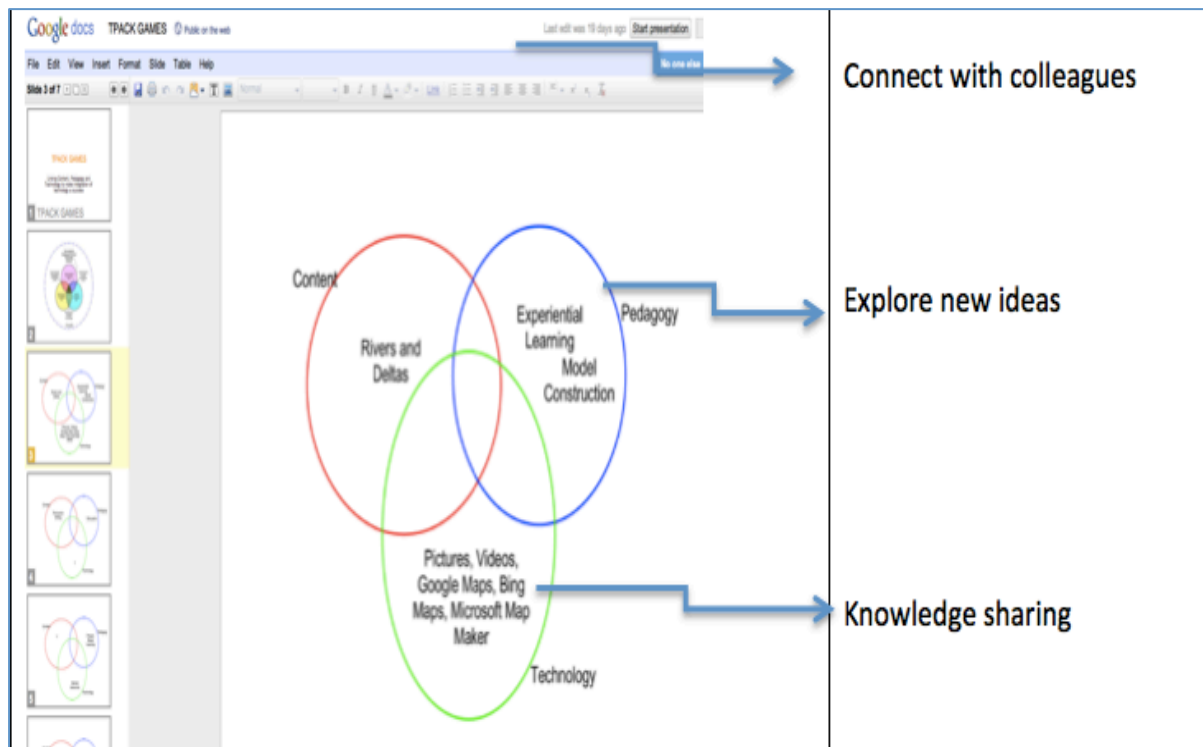
5.4.12 Summary of Participation in Site Activities

In this section, I have presented findings on how teachers participated in eleven different site activities. These activities were facilitated through different Web 2.0 tools. An examination of the activities seemed to point to why teachers participated in a certain activity. These were knowledge sharing, knowledge/information seeking, opinion sharing, opinion seeking, experience sharing, seek or give emotional support, self-presentation, exploring new ideas and reflecting on classroom practice (Hew and Hara, 2007; Hur and Brush, 2009; Pardo and Nussbaum-Beach, 2011). A number of activities allowed more than one theme to be derived, while different activities afforded teachers a variety of ways to express themselves.

5.5 Themes found in Teacher Participation in Site Activities

In analyzing the data found in the four previous sections, I have been able to explore four main themes that are useful in exploring participation on this site. The four themes are: Educational affordances of Web 2.0 tools, Benefits to Participants, Membership and Interaction Patterns and Roles of Participants. I present each of these themes in turn in the next section and discuss these themes in greater depth in Chapter 6.

5.5.1 Theme 1: Educational Affordances of various Web 2.0 tools

From exploring participation in the above 12 activities, I have found that teachers were able to engage in particular kinds of learning behavior, educational affordances (Kirschner et al., 2004). These are knowledge sharing, knowledge/information seeking, opinion sharing, opinion seeking, self-presentation, exploring new ideas, connecting with colleagues, reflecting on classroom practice and seeking or giving emotional support (Hew and Hara, 2007; Hur and Brush, 2009; Pardo and Nussbaum-Beach, 2011). Since a number of posts allowed several affordances, I have created the following table to highlight the occurrence of these affordances according to site activity.

Activity	Knowledge sharing	Knowledge seeking	Opinion sharing	Opinion seeking	Self-presentation	Explore new ideas	Connect With colleagues	Reflect On practice	Seek/show Emotional support
File sharing	✓	✓							
Blog posting	✓		✓	✓		✓	✓	✓	✓
Online course		✓	✓				✓		
Forum	✓	✓	✓				✓	✓	✓
Online chat	✓	✓	✓	✓		✓	✓	✓	✓
User profile creation			✓		✓		✓		
Add colleague							✓		
Wiki	✓					✓	✓		
Opinion poll				✓					
Media sharing	✓	✓	✓	✓		✓	✓	✓	✓
Google docs	✓					✓	✓		

Table 5-1 Affordances of various Web 2.0 tools

From the table above, affordances vary significantly by activity, with blogs, media sharing (which allow for discussions), forums and online chats bringing a range of affordances to the participant. It appears that participation in a combination of activities enables more affordances to the participant.

5.5.2 Theme 2: Benefits to Participants

For the purposes of further analysis, I have aggregated the affordances listed above into potential benefits of participation. I have considered Selwyn's proposition that Web 2.0 allows for the socializing of four human dispositions, that is the playful, the expressive, the reflective and the exploratory (Selwyn, 2008). I propose the following four benefits as Expression, Exploration, Reflection and Socialization. The table below (Table 5.2) shows how I categorized these affordances into potential benefits of participation to teachers.

Affordances from Web 2.0 tools	Benefits to Participants
Knowledge sharing Opinion sharing Self-presentation	Expression
Knowledge seeking Explore new ideas Opinion seeking	Exploration
Reflection on practice	Reflection
Connect with colleagues Seek/show emotional support	Socialisation

Table 5-2 Categorizing Benefits to Participants from Educational Affordances

5.5.3 Theme 3: Membership and Interaction Patterns

As participant-researcher, site designer and site administrator, I was the lead participant on the site. I initiated chats and wikis, postings on blogs and forums among others. I invited teachers to join the site during the second week of May and found that membership started from the 16th May onwards. The following graph shows the membership patterns at the start of the project (Figure 5-34). The graph also shows initial membership activity and that members engaged in site activities as soon as they joined, due to the closeness in patterns between the two graphs over the same time period. The first participant to join was Derek Haqq then Annoushka.

132
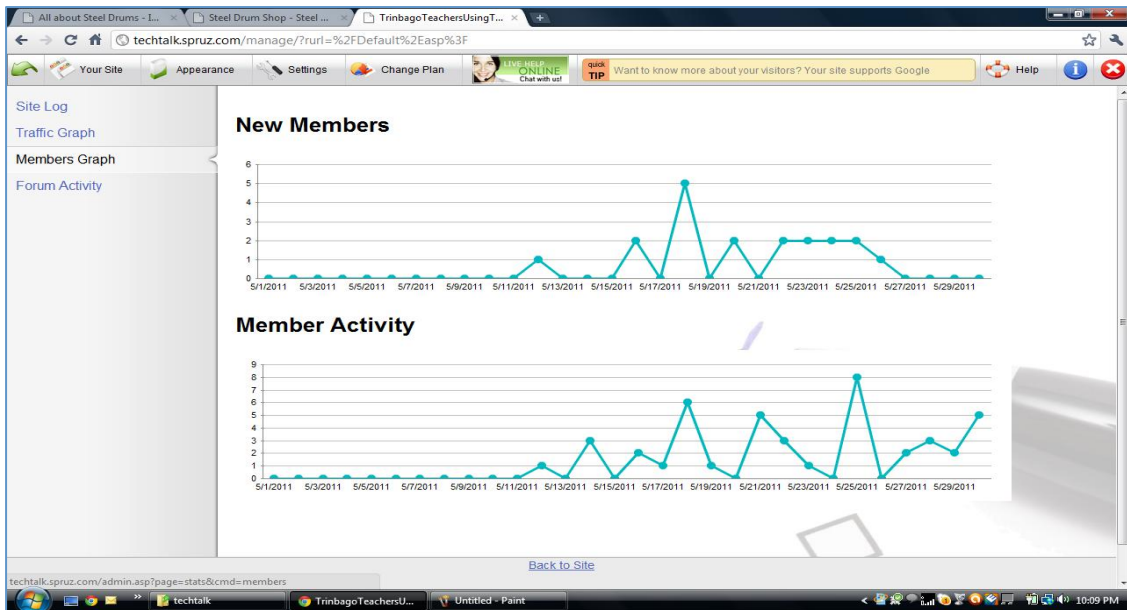
Figure 5-34 Membership and Interaction Patterns

Initially, I was the one with whom participants would interact. My networks of ties were those who added me as a colleague and responded to my postings. As such, there were one-to-one interactions on the site. The following diagram shows this network of ties (Figure 5-35). This diagram is a simplified version of a personal network diagram that is generated during Social Network Analysis.

Figure 5-35 Diagram showing Network of Ties at the start of the study

Over the next 8 weeks of the study, I noticed a change in the pattern of posting. In the latter part of June, approximately 5 weeks after the start of the website, one participant Yemi-J who

was an active contributor to the site took part in a real-time collaborative event with me. It was a wiki called Tpack games and led to this participant to create her own wikipage called 'What're your favourite tools to integrate technology?' She also participated in a number of online chats, initiated postings to the site, responded to comments and engaged in a number of conversations with other colleagues. Her posts drew interest from colleagues and there was greater dialog exchange among participants. The next diagram (Figure 5-36) attempts to illustrate the creation of further networks of ties through increased interactions on the site. While the diagram still shows me as the central person with whom participants interacted, it also shows that, over the period of study, that ties started to change and that Yemi-J emerged as another significant central person to whom relations were tied.
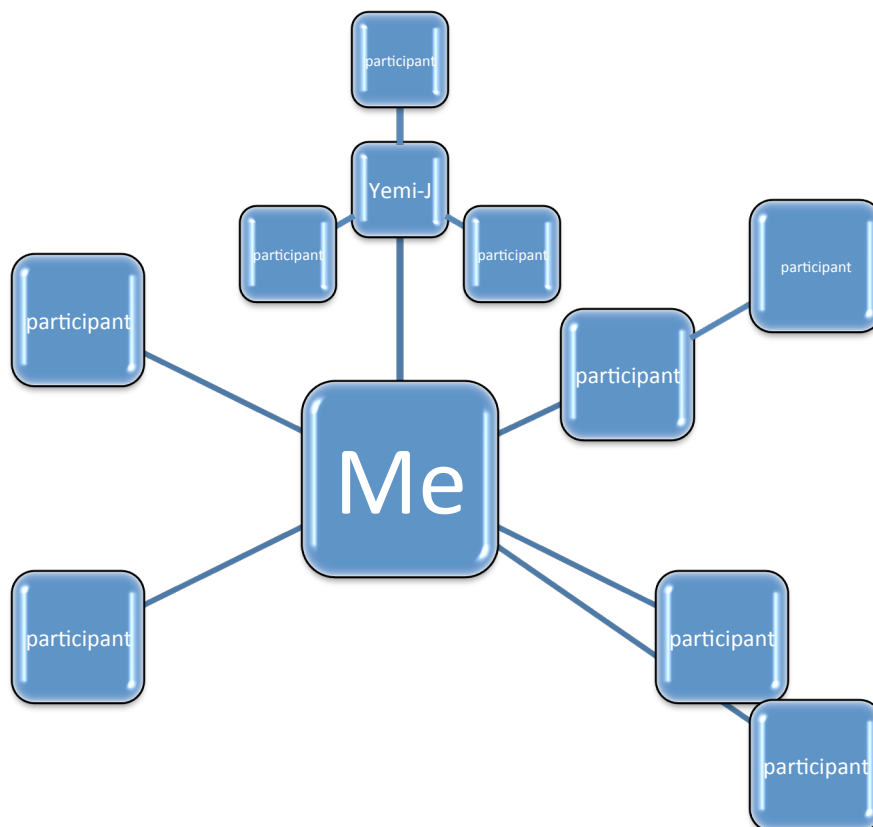
Figure 5-36 Diagram showing network of ties at end of study

A number of participants added Yemi-J to their personal network on the site and the snapshot here shows this (Figure 5-37).
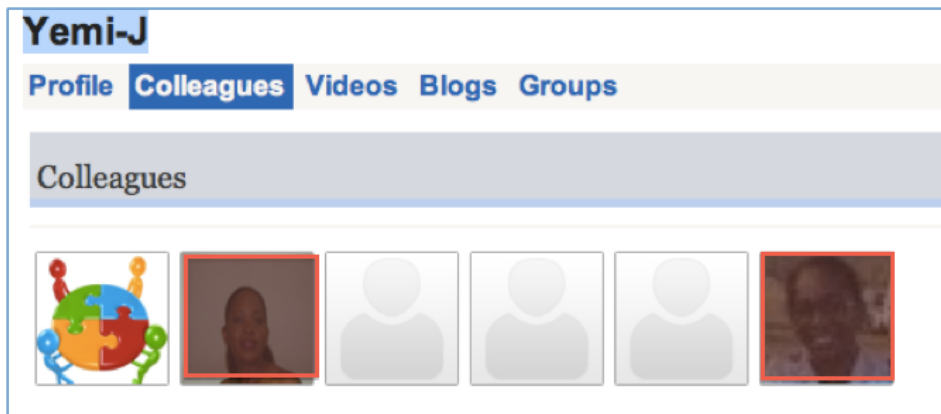
Figure 5-37 Yemi-J's network of colleagues

This system of networking encouraged further interactions among participants and shows that the site was able to facilitate interactions among participants in a number of activities and create social ties with colleagues, many of whom were unknown before (Lieberman and Mace, 2010).

5.5.4   Theme 4: Roles of Participants

Site participants had the option to select the activity type such as blogs, wikis, file downloads as shown in the section before. Over the research study period, Google Analytics recorded 688 visits to the site. Visitors who opted not to log in but simply view webpages by reading the content on the page are called readers. Certain site web tools, such as blogs and discussion forums, log the number of views while most others do not. Readers were able to surf the site view a page on site, search site for an item, click 'like' button, download a lesson and sign up for online course, without login in. Readers are also called content consumers as they access existing content without adding to it. Since some pages do not register or indicate who is reading the site, it was difficult to give details on the nature of the content consumed.

Participation also differed by the ways that participants chose to show their presence on the site. Logging in allowed participants to post comments or participate in a collaborative event. Most participants contributed to the site in writing text, but also used videos, photos hyperlinks, emoticons (in chats) or responses to online polls.

In this section, I explore various roles that participants played in the site over time based upon Preece and Schneiderman's (2009) model of roles of Reader, Contributor, Collaborator and Leader.

5.5.4.1 Role as Reader

Certain activities logged participant history and allowed information like date of post, category of post, title of post, name of poster, number of views and number of comments to be displayed. I now present this information in tabular form for blogs, forums and videos.

Category	Title	Date posted (2011)	Posted by	No. of views
My Lessons	Experimenting with PPT	Aug 22	Yemi_j	11
My Lessons	My first Google docs document	Jul 21	Lusha	22
Introductions	Information technology and me	Jul 19	Lusha	16
Web 2.0 tools	Configure your laptop	Jul 17	Vimala	4
Member Blogs	My students and me- why oh why do they make these mistakes?	Jun 26	Vimala	18
My Lessons	How do you give feedback to your students?	Jun 23	Vimala	3
My Lessons	Using ppt as an interactive learning tool	Jun 20	Yemi-J	41
My School	TTUTA's protest actions	Jun 16	Vimala	4
My lessons	Request feedback on your lessons today	Jun 11	Vimala	5
My Lessons	Collaborative classroom lessons	Jun 6	Vimala	20
Member blogs	CCX CAPE Pure Math unit 2 p2 fiasco	Jun 1	Vimala	43
Web 2.0 tools	Technology integration is not about technology	may 25	Vimala	4
Introductions	Introductions	May 14	Vimala	42

Table 5-3 Viewership in blog posting

Category	Title	Date posted	Posted by	No. of views
Curriculum Mathematics	The New Interactive Math Classroom	May 21	Vimala	34
Curriculum Spanish	Link to Spanish websites	Jul 21	Lusha	10
Curriculum VAPA	Go Animate	Jul 23	Lusha	8
Curriculum VAPA	Steelpan website	May 31	Vimala	3
Curriculum VAPA	VAPA curriculum	May 27	Allan	11
Technology-ICT	Internet Access for Form 1 students	May 19	Angel	168
Pedagogy				0

Table 5-4 Viewership in Forum Postings

Title	Date posted	Posted by	No. of views
PowerPoint for Training and Education	May 30	Derek Haqq	58
Music can change your mood	Jul 30	Lusha	39
Landforms valleys Spurs	Jul 20	Yemi-J	26

Table 5-5 Viewership in video posts

Blogs, forum posts and videos had 233, 234 and 123 number of views respectively and were posted to by a number of different participants across time. The activity with the highest number of views was a Forum post called 'Internet Access for Form 1 students' in the Technology ICT area started by Angel. Those who view postings can also be considered as content consumers.

5.5.4.2   Role of Contributor

Another way that participants indicated their presence on site was by contributing content to the site. This manifested itself in a number of ways such as: Creating a new post, Adding Comments to a Discussion/blog/forum, Responding to email, Responding to opinion polls, Adding a colleague, Uploading lessons/videos/photos and Signing in to a Chatroom. Types of content uploaded were pictures of practice, Text, Video, Click on poll, Email, User profile photo and User profile. Tools used to contribute content were Blogs, Forum, Email, Online poll and online chat. Contributors are also called posters or Writers or Content creators/ producers. Lead contributors to the site were Yemi-J, Stace, Pat1, Techsavy, Steve, AgriTech, Angel, Ms Wight, Lusha, Derek Haqq and Rosanna. Examples of these have been illustrated at length in section 5.4. Different participants added content to the site across time and as such became content producers and publishers. While different participants initiated postings, several others were able to build on those contributions.

5.5.4.3   Role of Collaborator

A number of Web 2.0 tools facilitate co-authorship between two or more individuals including wikis, Google Docs and real-time chats to create content. On this site, a wiki and chat tool was embedded on the site. Wikis allow users to read, add content and edit in a synchronous manner. This facility allows for collaboration in an online environment (Augar, Raitman and Zhou, 2010). Thus, I searched through the wikipage and identified the "What're are your favorite tools to integrate technology" wiki as one showing contributions from Yemi-J and myself over a two-day period. Figure 5-38 below shows the history of collaborations on this wiki. The rightmost column of the history shows the nature of change

to the wiki either in formatting or uploading of content. The tags 'Assessments, My experiences and Web 2.0 tools' are listed on the right side of the image.

Figure 5-38 Wiki page showing history of contributions to wiki "What're are your favourite tools to integrate technology?" by Yemi-J and Vimala

This example shows a number of revisions to the wiki between two persons. But does co-authorship imply collaboration? And do issues of time and space affect collaborative endeavors? An issue that I had to resolve in this study was what distinguishes contribution from collaboration. Haythornwaithe and de Laat (2010) argue that a post and a response is not sufficient to classify an interaction as collaborative and suggest that a response from the original poster is necessary. In addition, these authors argue for a timeline analysis to

"understand how people's engagement with learning and peer-support develops and evolves" (Haythornwaithe and de Laat, 2010, p.188). This argument supports my criteria for searching for evidence of collaborative endeavors on or through the site.

I have selected two examples to show how collaboration was enacted between two participants. In the first example, I show a screenshot of a blog post called 'Experimenting with PPT', Posted by Yemi-J Aug 22nd 2011 in the Category: my lessons.

Figure 5-39 BlogPost by Yemi_j

The next example shows collaboration through a video artifact. In this example, Yemi-J posted a PowerPoint video and explained why she used that tool see Figure 5-40). Another participant, Lusha, responded (affirmatively) and this was followed by a reply by the original poster, Yemi-J. This post is particularly fascinating due to the nature of the conversation, which seems to indicate a high level of reflection on the part of the author. The discourse also shows how subtly Lusha offered a recommendation for future work, so she did not simply share her opinion on Yemi-J's post but also actively engaged Yemi-J in a conversation about her work. This represents collaboration on ideas surrounding an artifact on the site.

Figure 5-40 Video uploaded by Yemi-J and comments

Collaborators benefitted from sharing the creation of content and saw who their collaborators were through a system of colour coding (see Figure 5-41). A revision history is automatically captured onsite and indicated the contributions of different persons. Figure 5-41 below shows a history of the creation of "Tpack games' presentation done by Yema and me.

Figure 5-41 History of collaborations between Participant and myself on a Google docs document called TPACK Games

The above examples indicate that Yemi-J acted in the role of collaborator with me on different occasions and through three synchronous tools. She has also participated collaboratively with Lusha in a blog post where there were exchanges of ideas and opinions. A few other similar examples of this type of collaborative discussion can be found on the site between myself and other participants, but these are few in number. As such very few participants acted in the role of collaborator on the site.

5.5.4.4 Role of Leader

Identifying leadership in a social network has not yet been clearly articulated and questions remain about whether criteria for leadership in social organizations apply to that in a virtual world. Analyzing conversations, participation patterns and other metrics can yield some cues to how a leader can emerge in a social setting, but may be inadequate. How roles are distinguished in a social network can be blurred depending on what data is being analyzed.

In analyzing data to see evidence of participants emerging as leaders, I developed a set of criteria of performance based on the literature (Danielson, 2006; McGuire and Gubbins, 2010; York-Barr and Duke, 2004). Leaders were those who took risks by trying new tool or activities, expanded their network of colleagues, acted in a mentoring role to other colleagues and encouraged professional growth of colleagues. As such, I describe leadership on the site

by participants taking on a combination of roles of Risk-taker, Networker, Mentor and Encourager. Leaders would have already satisfied roles of reader, contributor and collaborator, as indicated in previous sections. I shall now present examples of each of these criteria and identify participants who acted as role of leader on the site.

5.5.4.4.1 Risk-taker

I describe the role of risk-taker as someone who was willing to try something new, such as participate in an activity with which they were unfamiliar. I present two examples where Yemi-J contributed to the site in new activities by creating her own wiki and taking part in a *Google docs* online collaboration. Both these activities were new to her and she agreed to participate. The next two screen shots show evidence of these undertakings (figure 5-42).

Figure 5-42 Google Doc collaborations

5.5.4.4.2 Networker
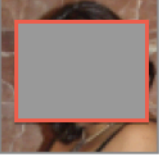
Initially, site participants were hesitant to add colleagues to their personal networks, but over time some participants appeared to be more popular. Two of the most popular participants are highlighted below, Derek Haqq and Yemi-J. I use screenshots of their profiles to illustrate their networks (Figure 5-43). I also refer to 5.5.3 where simplified SNA diagrams are used to show Yemi-J's networks.

Figure 5-43 Colleagues sample networks

5.5.4.4.3 Mentor

I describe this role as one where one colleague counsels another in an activity, especially in an encouraging way and making recommendations to improve the work in question. I choose an example where Yemi-J mentors Lusha after Lusha uploads a blog post called "My first Google docs document". Section 5.4.2 shows a screenshot of this post and one of its comments.
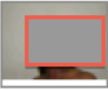
Yemi-J (Jul 30th 11)   **Reply / Delete**

I think this is a great idea! Gets students to learn about different types genres of music.

I do have a suggestion for the planning- to ensure fairness to all students you should have scheduled time within the project for the students to access the school computers. It doesn't have to be your class time necessarily, it can be a library period, or 20 mins from a home room session; and depending on how many computers are available, you can always divide them into smaller groups, so group A has 20 mins today, group B has 20 mis tomorrow etc. And any additional time they require they can arrange themselves.

Rate — 0 +

Lusha (Jul 30th 11)   **Delete**

Thanks for your suggestion re. computer time allotment. I have already discussed this with the person in charge of the Library at my school.

Each class has a Library period but the kids either sit talking or if they use the computer for anything but school work; so it would be up to me to encourage them to get the project done. They would be given more then enough time to have access to the computers (once they don't procrastinate).

Rate — 0 +

This example shows how a dialog Yemi-J acts in an encouraging and supporting role. In her opening statement, she responds to the ideas that Lusha has presented in a very positive tone "I think this is a great idea!" and also uses emoticons ":) I see lots of potential for this project :)" and affirmation to Lusha. Yemi-J also shares her professional opinions by making suggestions to improve Lusha's work, for example "Would you also consider letting them use maybe their cell phones to record some of the music?". Lusha, in turn, responds to the suggestions and negotiates her own position.

5.5.4.4.4 Encourager

I distinguish a leader as one who models good practices and encourages colleagues to improve their practice.

I have found examples on the site where participants provided models of good practice. In the first example Derek Haqq added a video called 'PowerPoint for training and education-a semi dramatic approach' while in the second example, Yemi-J created a wiki called 'What're are your favourite tools to integrate technology?' In each case, I show a small section of the contribution.

Derek Haqq

Hi everyone. This is just a simple example of how you can use Powerpoint animations and transitions in a movie-style presentation to support or enhance training/ educational initiatives. I used this as part of a training session both with a group of IT students and with a team of personnel within an IT department as a mechanism for reinforcing the need to truly understand a problem before attempting to solve it using information technology (or any other means). For

Yemi-J

HI Everyone,

I am uploading one of the power points I used in a lesson I taught in my class using the inductive questioning method.

The lesson is designed so that either I can use it as a group activity, with the entire class engaged with me, or students can use it on their own individually.

My objective is to design a lesson that can be used as a whole class activity or autonomously by using interactive learning tools. So all comments which can help me improve this, will be very appreciated :)

The next two examples are used to highlight advice from two participants 1) Derek Haqq and 2) Yemi-J.

In example 1, Derek Haqq adds his comment to a forum post called "Internet access for Form 1 students" after a chain of comments. Most of the previous comments reflected some measure of frustration by participants with Internet access and some had negative undertones. It appears that Derek was offering advice to teachers about looking for solutions within their school environment. After Derek Haqq's comment, there were no further posts by teacher participants.

In example 2, I highlight a portion of an online chat with Yemi-J where she gives advice on what I could add to the site as an activity. This chat took place on 28/6.

Both these examples are selected to illustrate the advice that was given to participants on the site, including myself.

The examples given in this section show how two participants, Derek Haqq and Yemi-J, acted in a number of different roles on the site. Derek Haqq acted as Networker and Encourager but I did not see evidence where he acted in a mentoring role on the site. In contrast, Yemi-J acted in all 4 roles, on several occasions. Based on my criteria for leadership on the site, I have therefore found that one participant emerged as leader, Yemi-J, as she satisfied all criteria.

The diagram below, Figure 5-44, shows a history of participation of Yemi-J from the time of registration on 24 May. It shows participation in a range of activities beyond the research period ending in September. Over this time, she has added her comments to blog, forum and discussion posts, added new content in terms of lessons, videos, comments and opinions. She expanded her network of colleagues by not just adding colleagues on the site but inviting new teachers to join the site. She was collaborated with a number of colleagues in different ways such as forums, blogs, wikis and chats. She initiated conversations with colleagues by starting her own wiki and made significant comments on improving the site. She modeled good practice by her artifacts of lessons and engaged in discussions related to practice.

History of Participation of Yemi-J
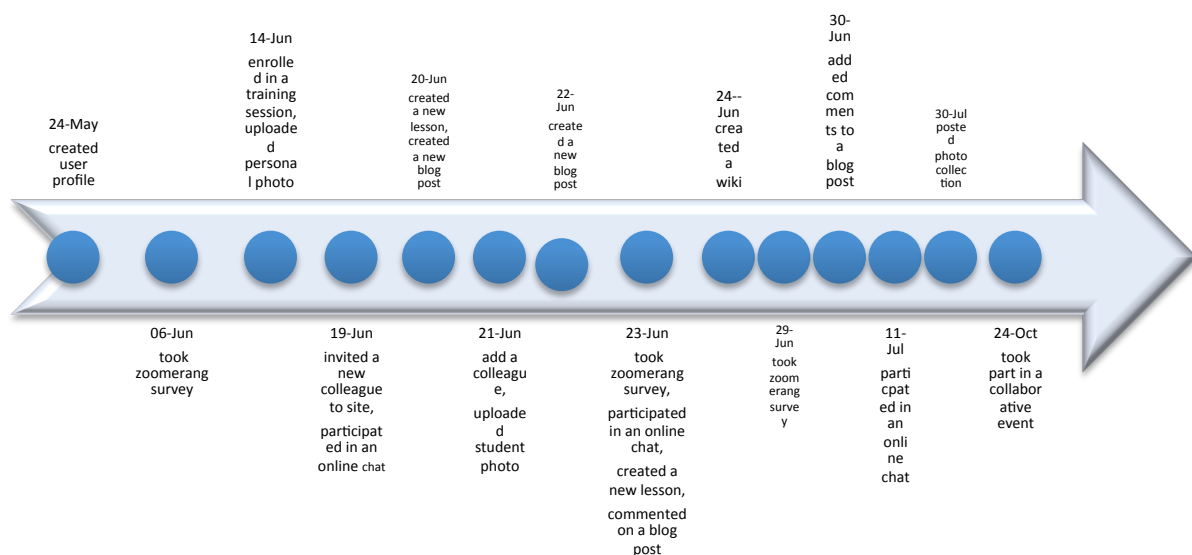
Figure 5-44 Timeline of Yemi-J's participation

5.5.4.5 Summary of Participant Roles

I have observed the roles that participants have chosen to play on the site and have categorized these roles according to Preece and Schneiderman's (2009) model. Roles of windowshopper, reader, contributor, collaborator and leader have been identified. The role of reader was evidenced by fulfillment of other roles such as risk-taker, networker, mentor and encourager. I suggest that the role of reader is content consumer and contributor as content producer. Collaboration is seen through postings and responses in delayed time and through a

series of time logs in real-time activities such as online chats. I use the term 'windowshoppers' to describe a visitor to the site who may not be registered. I believe this term is appropriate as it describes a person who visits the site, spends approximately 12 minutes on the site and views about 8 webpages in that time (see Figure 5-1) but does not *actually* enter the site or request registration. As such, I have further categorized the role of reader into two roles, that of windowshoppers and that of content consumers.

5.5.4.6 Analyzing Differences in Teachers' Participation

In order to explore differences in participation, I compared participation by reading to writing/adding content. For each activity, I present findings in a table form (see Appendix 8) related to categories of the posts in the activity, dates posted, poster name, and a comparison of views to comments. The activities selected are blogs, forums and videos as these activities had a log of views and comments on the site. Other activities such as wikis, discussion topics, photos, file downloads did not show a record of such data.

A review of the number of comments to views in blogpostings showed that there was an average of 18 views per post to 2 comments for the same post. This indicates that only 1 in 9 or 11% of participants chose to comment as opposed to view. The graph below, Figure 5-45, shows the significantly higher number of views to number to comments in blogposts.
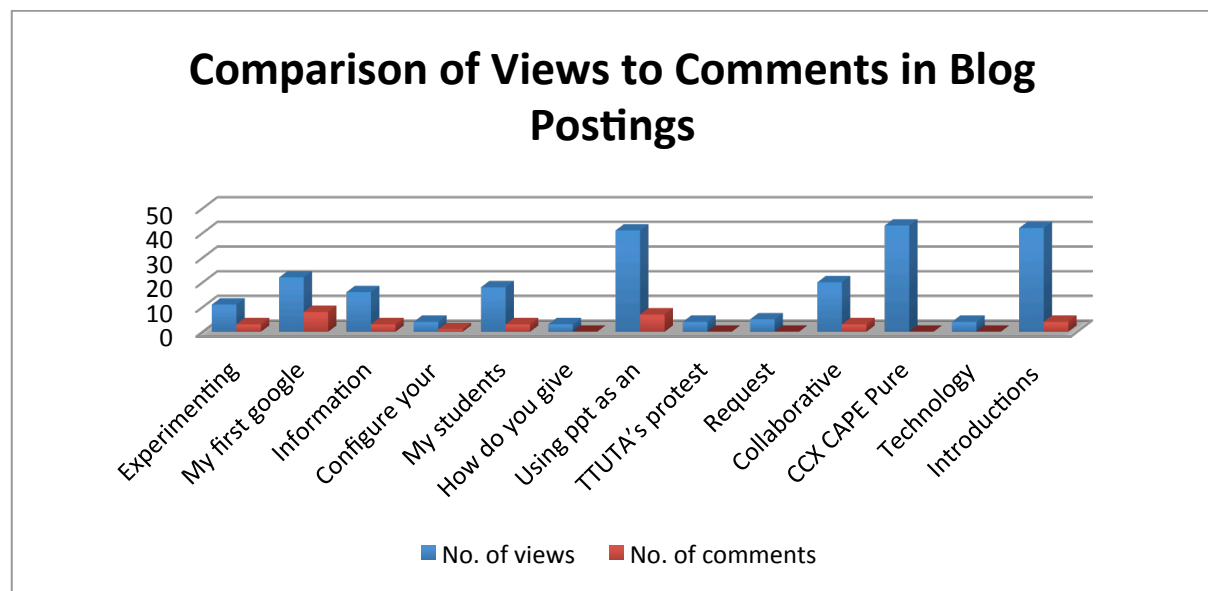
Figure 5-45 Comparison of blog views to comments

When data from blogs, forums and video-sharing is compiled (see Appendix 8), the number of views exceeded the number of comments in all cases. Blog postings had a higher number of postings than forums or videos. The total number of postings in all 3 activities was 590 compared to 44 comments total, which averaged 7%. That meant that for every 100 views there were 7 postings. Further, the tables show that different participants added content to the site across time. In the Forum activity, one topic thread each was created in three different Curricula areas while one thread was created in Technology. The ICT thread in this Forum was the most popular activity with 168 views and 8 replies. The chart below compares ratios of views to comments in blogs, forums and video-sharing.
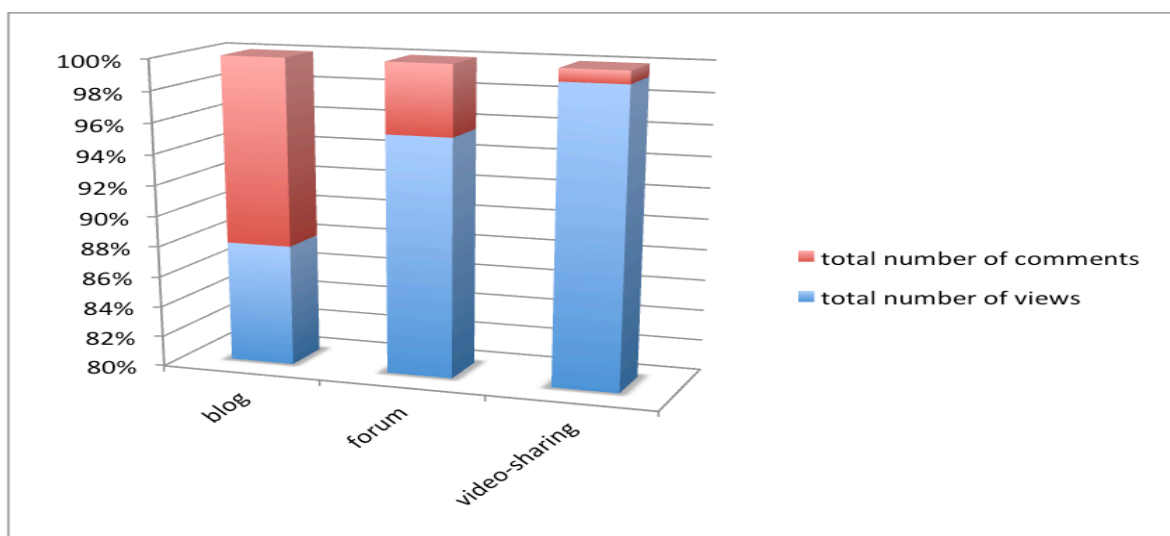
Figure 5-46 Comparison of views to comments in certain Web 2.0 tools

The pie chart below (Figure 5-47) shows that participants preferred viewing to posting comments in blogs, forums and in video-sharing even though blogs seemed to facilitate a much more comparative balance. The ratios are particularly high in favor of viewing.
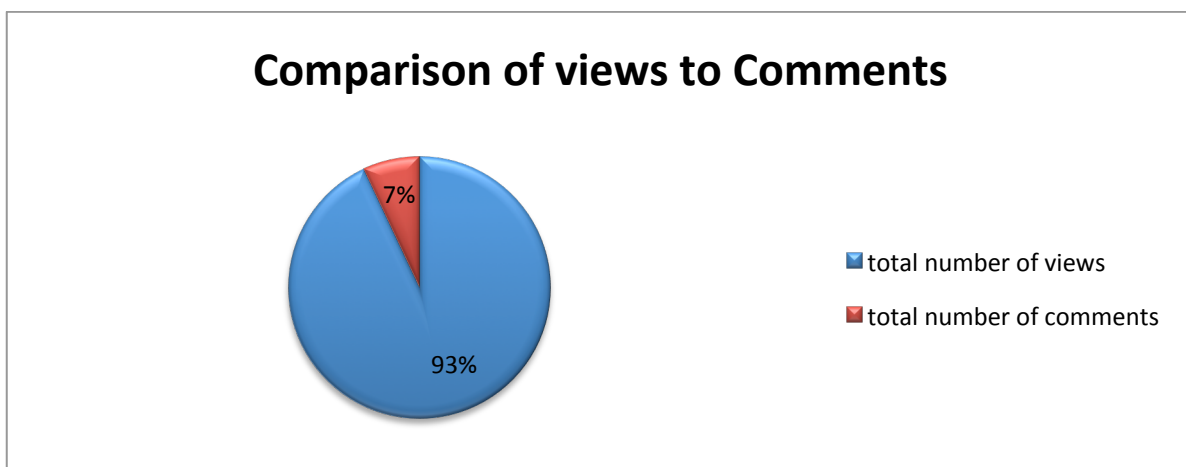
Figure 5-47 Comparison of views to comments on the site

These data have indicated that while participants have the option to contribute content to the site, they generally preferred to simply view existing contents.

5.5.4.6.1 Exploring Reasons for Roles played

In order to understand reasons why participants chose a certain role on the site over another, I explored participation of 3 teachers in more depth. I treat teachers separately from my colleagues from the Ministry of Education.

5.5.4.6.1.1 By teachers

Based on data gathered from the site and online questionnaires given to three specially chosen teachers, I present data on how three site-registered teachers described their experiences based on participation on the site during May and June. I present these data separately in anecdotal form.

Steve

Steve claimed he entered the site very few times and was registered on 7th June. His last visit was July 11th and during this time, he set up his user profile and participated in some online polls. He said he spent some time on the site just reading. He accepted the invitation, as he wanted to find colleagues with similar interests. He claimed that Internet access, work priorities and difficulty in using the Web 2.0 tools on the site were the main barriers to his participation. He felt most comfortable using email and used online polls/surveys for the first time on this site. He claims he was aware of online courses being offered for PD, but found the site fairly difficult to navigate. He felt that the site did not allow him to express his views freely but did allow him to network with colleagues in other schools. He felt that the site exceeded his expectations in showcasing technology-led lessons and fairly well in meeting other colleagues. He felt good to be part of the network and felt that it could evolve into a professional community of teachers.

Angel

Angel was registered on the site from 18th May to 2nd June on 7th June. Her last visit was July 11th and during this time, she set up her user profile and spent time on site reading and participating in opinion polls/ surveys and in posting comments on the discussion Forum. She launched the forum topic 'Internet access for Form 1 students', that was the most popular activity on the site (see section 5.4.4 above). She accepted the invitation, as she wanted to learn something new and felt that the site met these expectations well. She claimed that she

was too busy with schoolwork to participate more and she actively used Facebook. She felt most comfortable using email and blogs. She found the site 'interesting'. She claimed that she was aware of online courses being offered for PD and that the site allowed her to express her views freely but did not allow her to network with colleagues in other schools. She felt 'wonderful' to be part of the network and felt that it could evolve into a professional community of teachers. She felt that I listened to her previous comments on ways to improve the site. This was her response "You already did, when you put up what's events are coming up via the most popular social network – facebook".

Yemi-J

Yemi-J spent more than six months on the site and was registered from 24th May to 1st November. During this time, she visited frequently and contributed to the site in a number of different ways. Her initial reason for joining the site was to share her expertise with her colleagues. She set up her user profile, and spent time on site reading, participated in opinion polls, discussion forums, media-sharing and blogs. She created a wiki, collaborated on a Google doc presentation and engaged in a number of online chats. She found the site 'interesting' and said work priorities prevented her from participating more. She felt comfortable using blogs and emails and participated for the first time in a Forum. She felt that the site was not that easy to navigate. She claimed that she was aware of online courses being offered for PD and that the site allowed her to express her views freely and allowed her to network with colleagues in other schools. She felt that the site met her expectations well in showcasing technology-led lessons. She felt 'great' to be part of the network and felt that it could evolve into a professional community of teachers. Her open comments were "Spread the word so more teachers will use it!"

I summarize some key data from these interviews on these three participants in Table 5.6.

In examining teachers' views on their roles on the site, I have found a relationship between their participation patterns and the roles played on the site. Steve claimed that he did spend time reading on the site and even take part in opinion polls. Since my site did not register names for polls I was unable to track this, so the only participation I have recorded for him is setting up his user profile. As such I evaluated him to be a consumer of site content and suggest that he played a role as of reader on the site. He claimed that a number of barriers prevented him from participating more such as Internet access, work priorities and difficulty in using Web 2.0 tools on the site.

Parti- cipant Name	Reasons for Participation given at beginning of study from user profile	Participation Activities	Frequency of participation in selected activity	Duration of partici- pation	Reasons for levels of participation during study
Steve	Connect-Finding Colleagues with Similar interests	just reading user profile online polls	Few times	7/6-11/7 (1 month)	Internet access Work priorities Difficulty in using Web 2.0 tools on the site
Angel	Learn-Learning something New	User profile Opinion poll Forum	occasionally	18/5-2/6 (2 weeks)	Too busy with school work and using Facebook
Yemi-J	Share-Sharing Expertise with Colleagues	User profile Online poll Forum Wiki Blog Email Online Chat Google docs Media- sharing	frequently	24/5-1/11 (6 months)	Site is interesting. You are doing a great job. The discussions were related to my interests.

Table 5-6 Reasons for Levels of Participation from Selected Teachers

While Angel did not spend a long time on the site (2 weeks) she did make a meaningful contribution by her post 'Internet access for Form 1 students' as this post generated the most interest in all activities on the site. She did contribute to the site by adding content and so I call her a content producer or contributor. She claims that that she spent time on Facebook, which may have affected her greater participation on the site. Yemi-J made her presence felt

on the site and participated in almost every activity, with success. She emerged as leader on the site by not only reading and contributing content but also by collaborating with me and other colleagues in a number of activities (see section 5.5.3.4). She acted in a number of roles such as initiator, networker, risk-taker, mentor and adviser over time. She also claimed that work priorities were an issue for her, but that did not appear to impede her site participation and the multiplicity of roles on the site.

5.5.4.6.1.2 By MOE officials

Based on data gathered from the site and face-to-face discussions with one Educational Technology official and two Curriculum officers, I present data on how these site-registered officials described their experience with the site. While all 8 curriculum officers were invited to the face-to-face session to discuss the site, only two officers turned up. I present these data separately in anecdotal form. The screenshot below illustrates my request to meet.

--- On **Sun, 7/3/11, Judy Kamalodeen** <*fjkamal@yahoo.co.uk*> wrote:

From: Judy Kamalodeen <fjkamal@yahoo.co.uk>
Subject: FW: Kind yet Urgent Request to discuss my Research Project-TrinbagoTeachersUsingTechnology project
To: derek_a_v_h@yahoo.com
Date: Sunday, July 3, 2011, 3:22 PM

From: Judy Kamalodeen [mailto:fjkamal@yahoo.co.uk]
Sent: Sunday, July 03, 2011 10:19 AM
To: 'ingrid kemchand'; 'dass_indra@hotmail.com'; 'chemofficer@hotmail.com'; 'Mala Morton-Gittens'; 'Bebe Ajodha'; 'vashtierg@yahoo.com'; 'herbieg51@yahoo.com'; 'cgee112000@yahoo.com'; 'rose.linds@gmail.com'; 'd_a_v_h@yahoo.com'
Subject: Kind yet Urgent Request to discuss my Research Project-TrinbagoTeachersUsingTechnology project
Importance: High

Hi Ingrid,Indra,Terrance,Mala,Bebe,Vashtie,Herbert,Tricia,Rose,Derek

How are you? I know that things are hectic in CPDD and with the many changes you are all as usual short-staffed and busy.

To keep it brief and succinct, I want to thank those of you who were actually able to join my site and even look at it a couple of times. I know several of you may not have been able to do so for one reason or another.

The site is now 6 weeks old and am quite happy with the participation I have seen from teachers who were invited. To date there are 31 participants from all 8 curricular areas plus IT. One or two persons have emerged as leaders on the site. Two of the more active participants are Trinidad and Tobago's ecal reps in Santiago de Chile competition.

At this time, end of the term, I would like to evaluate my research idea and I would like feedback from each one of you. You may remember that I spoke with each of you individually inviting you to share in this research and to support it as Curriculum and Media/Tech colleagues.

It does not matter if and how you participated, I still need your views on the issue. Remember this is a research project and honest views are absolutely important to understand how we move forward as a team anyways.
I just need to ask a few☺ questions from each of you to complete my data collection process. So I would like to find out how when and where would suit you.

Figure 5-48 email to MOE participants

Vashtie

Vashtie is a curriculum officer responsible for Social Studies and she joined the site on 9ᵗʰ July for one day after several reminders. She joined because she wanted to find colleagues with similar interest. When asked about here level of participation on the site she said that she did not remember getting an invite. She said that she was "Too busy at work" and that the site was ""low in my priority list". She also said that, " I will make an attempt to look at it. Sorry for being delinquent."

Ingrid

Ingrid is a curriculum officer responsible for Foreign Languages and she agreed to join the site. The screenshot below shows her interest (Figure 5-49).
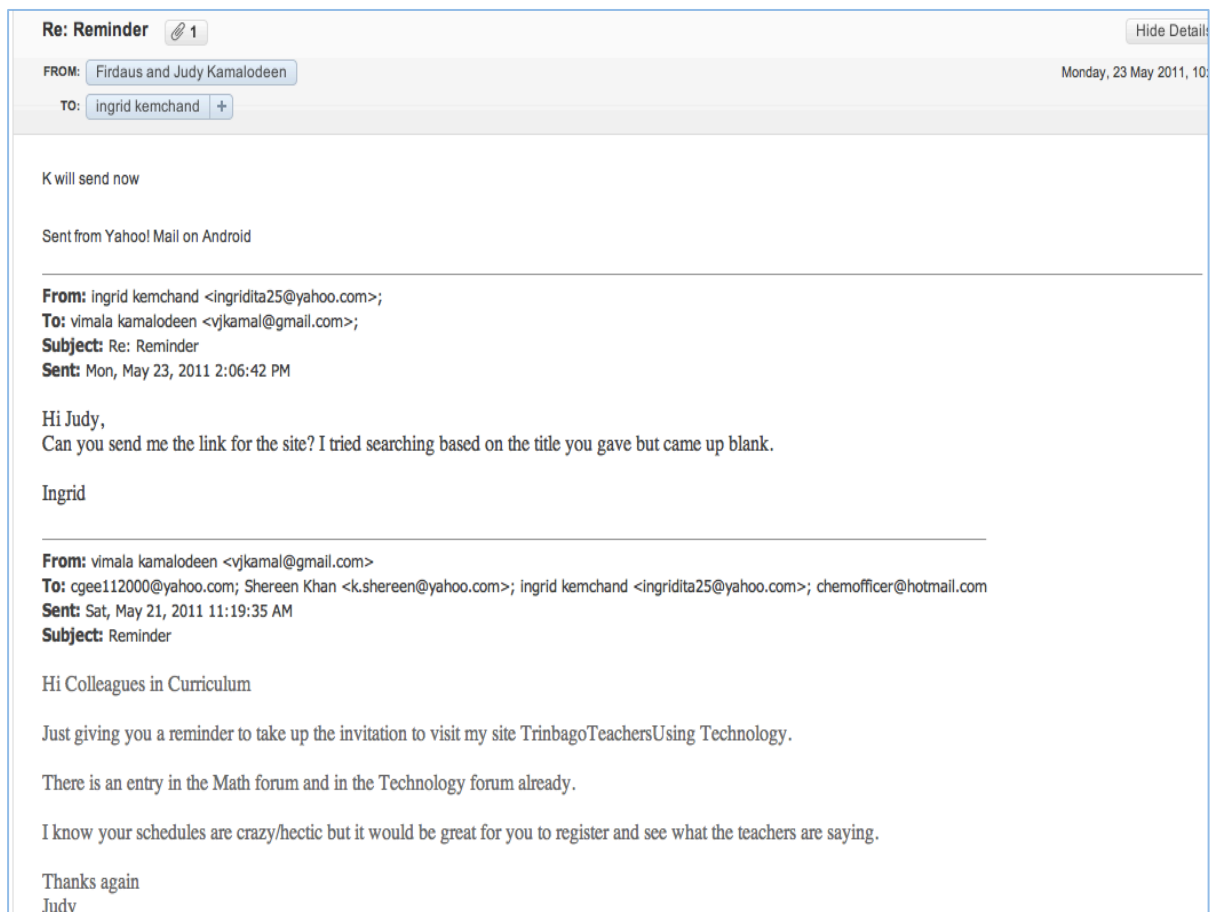
Figure 5-49 email from Ingrid

She joined the site to share her expertise with colleagues but remained for only one day, 26/5-27/5. When asked for reasons for her low participation levels she said the following:

> "I have own email group with my subject area teachers. I agreed to participate as I
> was the only Foreign Language CO at MOE"

She was unavailable to give any further insights about the site.

<u>Derek Haqq</u>

Derek Haqq joined the site on 16/6 and stayed until 12/7. He too expressed a desire to find colleagues with similar interests and is also a member of Facebook and LinkedIn. He has made some significant contributions to the site in terms of media-sharing and Forum posts. He exhibited leadership qualities by taking on the roles of Networker and Encourager. He critiqued the site for being too difficult to navigate and advised me on how to improve the look and structure of the site. He said that low response to his posts led to declined interest in participation.

These data provide limited opportunities for analysis of participation among MOE officials. I had anticipated that they would have taken up the role of mentors on the site as curriculum and technology experts. However this was hardly seen. Derek Haqq was the only official who made significant contribution to the site and did act in roles higher than contributor, but did not emerge as a leader on the site based on my criteria. Officials generally claimed that time and low interest in the site were the main reasons for their lack of participation and possibly only agreed to register due to repeated requests by me.

5.5.4.6.1.3 Summary of Reasons for roles played

In summary, I have found that time/ work priorities were a common factor among all 6 participants. Low interest in the site as well as technology difficulties also contributed to low levels of participation. I also suggest that other ways of social networking, such as Facebook, which were more familiar to participants affected participation on the site. As such many participants remained as content consumers and minimally as content producers. In general, teachers seemed more interested in participating on the site than MOE officials. They felt that the site met their original expectations quite well and expressed positive comments about their participation. They generally felt that the site allowed them to network with other colleagues and to express their views freely. A leader emerged on the site, who acted as a mentor to other colleagues, but this leader was a teacher, not a MOE official. She wanted to share her expertise with her colleagues and she did, in many ways over a significant time period.

5.6   Key Findings From the Data

I now summarize key findings from the data and will discuss these in greater depth in the next chapter. Teachers participated in a range of site activities with a preference for online polls and blogs. They seemed to come onto the site outside school hours and there was increased site activity during the school term on public holidays. Activities facilitated through asynchronous Web 2.0 tools were preferred to synchronous ones. Teachers seemed to benefit from participating in both types of activities in a number of ways. These affordances were categorized as Expression, Exploration, Reflection and Socialization. I have suggested five roles of participation on the social networking site, which are windowshopper, content consumer, content producer or contributor, collaborator and leader.

6   Discussion

In order to explore teachers' participation on the site *TrinbagoTeachersUsingTechnology*, I developed three research questions. In the last chapter, I generated four themes from the data, which I now use to answer these research questions. In this chapter, I also use qualitative data from interviews that I conducted with selected participants at the end of the research period to allow for a deeper understanding of low levels of participation that preliminary analysis of the data in Chapter 5 revealed. This chapter is presented along the lines of each of the three research questions which are discussed in detail and supported with ample evidence such as screenshots of website data, participant quotes and interview data.

6.1   Research question 1: How do teachers participate in an online professional social network?

Site participants were secondary school teachers from Trinidad with a few Ministry of Education officials plus myself. Participants adopted different roles during the course of the study and a number of unregistered persons visited the site directly and indirectly. Participants accessed the site from a variety of locations across time and selected a number of activities for participation. Most participants presented themselves professionally, using their real names but generally, did not choose to upload a profile photo. Participants were twice as likely to be female than male and were between 24 and 60 years old.

6.1.1   Participation took place on the site regardless of geography/location

156 visitors came from more than 10 countries, including the USA and the Caribbean, but the majority came from Trinidad. Participants came from all educational districts in Trinidad, with slightly more teachers from urban schools. Visitors used mobile and desktop technologies to access the site directly or indirectly through a search or came through a referral site such as Facebook or Twitter. From the data, (section 5.1), teachers seemed to access the site more regularly from home than at school. Visitors used a variety of known browsers such as Google Chrome and Internet Explorer to enter the site but also used tablet and mobile phone browsers including Blackberry.

6.1.2   Participation took place across time

Teachers visited the site at all times, but night visits seemed more popular. Teachers also visited the site differently over the duration of the study and also varied the number of times

they visited and how long they spent on it (section 5.2). Teachers preferred to visit the site during non-school hours and there was no particular day of the week that was preferred except the number of visits to the site increased significantly during a public holiday during the term. Teachers had greater participation during the school term than during the vacation period.

6.1.3 Participation took place through the affordances of various asynchronous and synchronous Web 2.0 tools

The site allowed teachers to select activities for participation, afforded through various embedded Web 2.0 tools (sections 5.3 and 5.4). Asynchronous activities included media sharing of lesson plan files, videos, photos; *blogs*; discussion forums; creating a user profile; adding colleagues; emails; signing on to an online course and taking opinion polls. Synchronous activities are *wikis*, *online chat* and *Google docs,* the latter being facilitated offsite. Affordances varied significantly by activity (see table 5.1). Blogs, media sharing, forums and online chats brought a range of affordances to the participant.

The combination of asynchronous and synchronous Web 2.0 tools allowed participants a number of opportunities to connect with and communicate with one another in a shared space. The limitations of one Web 2.0 tool were diminished by the affordances of others and participants exercised flexibility by choosing real-time or delayed responses. Participants were able to seek/share knowledge and opinions, get or show emotional support to colleagues as well as connect with colleagues, explore new ideas and reflect on practice.

6.1.4 The site allowed for interactions among participants in various activities

At the start of the study, I initiated postings on the site and participants interacted with me only. As such, there were one-to-one interactions on the site (see figure 5-35). There was a moderate response to my postings. After six weeks, interactions among participants changed a bit when Yemi-J started to initiate postings and contributions such as her wiki and video and collaborated with others. Participants responded to Yemi-J's postings especially Lusha and added Yemi-J to their personal network. Derek Haqq also attracted a number of colleagues to his personal network. I did not find that MOE officials interacted with teachers as I had expected. This system of networking encouraged further interactions among participants and shows that the site was able to facilitate interactions among participants in a number of activities and create social ties with colleagues, many of whom were unknown before (see figures 5-36 and 5-37). Certain activities allowed higher degrees of interactions

than others. The forum post 'Internet access for Form 1 students' facilitated a number of interactions among 8 persons. Perhaps it was the nature of the post that attracted participants to interact with each other. These findings support arguments that social interaction is enabled through embedded Web 2.0 tools on a SNS (Davies and Merchant, 2009; Selwyn 2009; Greenhow, Robelia and Hughes, 2009).

6.1.5 Participants were actively involved in site activities

There seemed to be some levels of active participation in many site activities, with greater participation in activities facilitated by asynchronous tools over synchronous ones. It is felt that due to the delayed nature of response, asynchronous tools seemed to be preferred by teachers. Blogs seemed to be the most popular activity, compared among other tools. Perhaps this is because they are quite established and easy to use (Loving, Schroeder, Kang, Shimek and Herbert, 2007) or perhaps due to the rise and popularity of edublogs (Merchant, 2009). Lankshear and Knobel (2006) suggest that blogging is successful probably because it is based on authentic (real-world) literacy practice.

There were 14 different blog posts in 6 categories, 3 video uploads, 11 photos uploads, 4 uploaded lesson plans and several downloads in selected lessons, 6 threaded discussions in Forums in three Curriculum areas and ICT and 3 online courses developed with 31, 60 and 3 subscribers in respectively. There was no evidence of participation in 'groups' or in using the online lesson-planning template. There were 5 wikis and 1 Google doc created as well as a number of online chats. Online chats facilitated real-time conversations and was enabled through *Google chat* with *Gmail* addresses. Chats were more successful than other synchronous activities like *Google docs* and *wikis*. Knobel and Lankshear (2009) note that wikis have been overlooked in education, perhaps because setting it up is not as easy as that of other tools.

Participants spent an average of 38 days visiting the site over the period May 18 to August 31. More than 75% of visitors were repeated. There were 688 visits to the site during the research study period, with visitors staying more than 12 minutes on the site on average and viewing more than 8 pages in that visit. One participant, Pat1 spent over 161 days visiting the site but activity levels were low. Several participants took part in several activities but I did not find that other participants displayed participation in multiple or sustained ways.

6.1.6   Participants adopted a variety of roles on the site

I have suggested that participants on the site greatly preferred to view activities facilitated through certain Web 2.0 tools and only a small percentage of them chose to post comments (section 5.5.4). These types of activities point to differences in the roles that participants play on the SNS. I have suggested five roles of participation on the social networking site. These are window-shopper, content consumer, content producer or contributor, collaborator and leader, which represent an adaptation of Preece and Schneiderman's (2009) model.

I describe *window-shoppers* as those who visit the site, spend time on the site reading but did not register. I suggest this term instead of the term 'lurkers', which is commonly found in the literature to describe those on the periphery of a community. I distinguish these *readers* from those who are registered on the site but did not do significantly more than set up a user profile. I call the latter group *content consumers* which contrasts with those who produce content. Steve was an example of a content consumer and apart from setting up his user profile, said that he spent time on the site reading and taking part in online polls. Two MOE officials, Vashtie and Ingrid, were registered but barely spent any time on the site and thus can barely be described as *content consumer*.

The role of *content producer* was well evidenced as participants added content to the site in a number of ways and through a number of Web 2.0 tools. In this way, participants acted as content creators or producers. Angel is an example of a content-producer as she posted comments in the Forum, while others posted comments in blogs, responded to emails, uploaded lessons/videos/photos and added content to wikis and Google docs. Content producers seemed to be satisfied with the site and found it interesting.

The role of *collaborator* was adopted by very few persons and was evidenced by participation in synchronous activities such as chats, wikis and Google docs. In addition, collaboration was described in asynchronous activities such as forum posts where there were a number of exchanges between the original poster and the responder. Lusha, Yemi-J and Stace may have adopted these roles at certain times.

The role of *leader* was the most complex to analyze and encompassed a number of other roles such as that of Networker, Risk-taker, Mentor and Encourager. Two persons were in close contention for this role, Derek Haqq and Yemi-J but the latter emerged as a leader on the site. Criteria for satisfying this role were met and a history of participation showed how

Yemi-J acted in all of the roles listed here namely that of reader, contributor and collaborator before emerging as leader.

These findings seem to be consistent with that of Preece and Schneiderman (2009)'s findings who suggest that while many people participate in online activities by reading, only a fraction will actually contribute by writing in text-based narratives or uploading other digital media forms or including links to other sites or pages. The data has indicated that while participants had the option to contribute content to the site, they generally preferred to simply view existing contents. In online spaces that facilitate knowledge-sharing, participation can be categorized as either reading or content consumption and writing or content production (Phang, Kankanhalli and Sabherwal, 2009; Davies and Merchant, 2009) or even both, which can be encapsulated as content *prodsumership*. These twin actions represent the more cognitive dimensions of participation, which Selwyn (2008, p.9) describes together with the social dimension, are directed at learning. These findings are also consistent with that of National and Caribbean technology Business observers who lament about Trinidad and Tobago's and Jamaica's declining status in innovation. SiliconCaribe commented "We (Trinbagonians, Jamaicans etc.) seem to be content to be consumers of technology and not creators of technology and the wealth that comes with that" (Riley, 2011).

In order to present a conceptualization of the way participants enacted different roles on the site, I designed the following diagram using a basic Venn diagram tool (see Figure 1 overleaf). This diagram shows the relative interrelationships among the five roles played by participants based on the occurrences of these roles on the site. The largest group is *content consumers* and only 7% of these have been found to be *producers*. An even smaller percentage acted as *collaborators* and only one person emerged as a *leader* on the site. I used a set of concentric circles to show the connections among these roles and adapted circles to form ellipses to show the lack of perfection in these relationships. The relative ratios of these circles/ellipses are deliberate to reflect the differences in occurrences of these roles. I have placed *window-shoppers* on the periphery of the circle of participants as it represents an undetermined number of site visitors, which are on the outside looking in but cannot be classified as participants as they did not register on the site and chose not to place a boundary on it as this role represents an undeterminable number of possible Internet visitors.
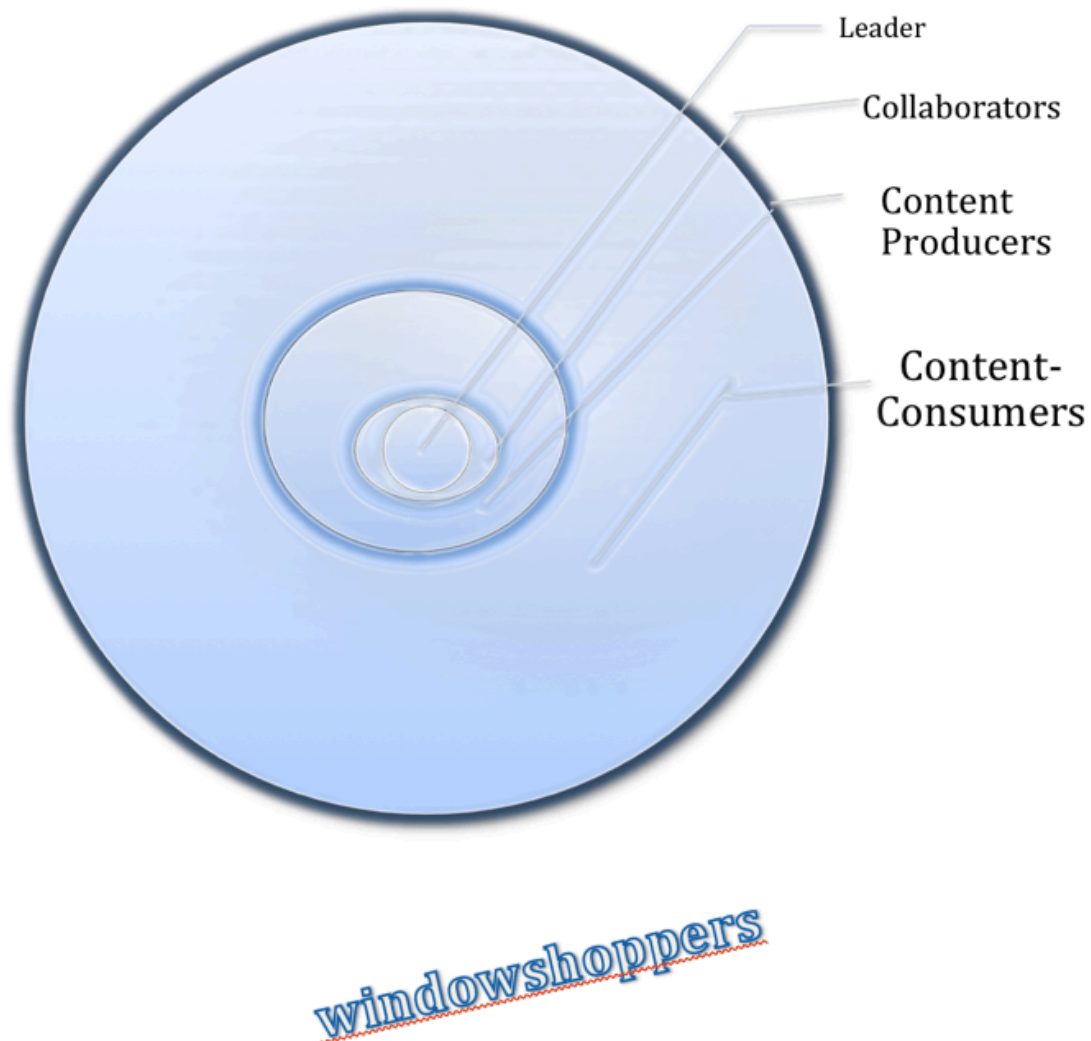
Figure 6-1 Diagrammatic representation of the relationship among participants on the site

6.1.7 Reasons for differences in participation

In this section, I suggest a number of different barriers to teachers' participation. They include that of time constraints, culture, personal/social, motivational /psychological, mental and technological.

6.1.7.1 Time Barriers

In examining reasons for differences in levels of participation on the site, teachers all seemed to indicate that a lack of time/work priorities contributed the most to lower levels of participation. This barrier seems to be supported in the literature (Hew and Hara, 2007). Time

is an important factor in understanding site participation on several fronts. Flexibility in time and access to site activities brought control of participation to participants (Brown, 2005; Selwyn, 2008) and teachers did exercise this flexibility by accessing the site at all different times of day and night, day of the week and month of the year. In addition, this flexibility allowed teachers to participate in site activities from their homes and other spaces. All online chats, for example, took place at night. On the other hand, time has been identified as a factor affecting teachers' involvement in professional development opportunities (Dede, et al., 2009; Lawless and Pellegrino, 2007; Ostashewski and Reid, 2010a; Levin and Wadmany, 2008). It seems that a lack of time to engage in social networking activities (Ray, Kalvaitis, Wheeler and Hirtle, 2011) has affected teachers' levels of participation.

Time is a complex issue in teachers' self-directed learning, as it appears that when teachers do have the time to participate, as in the July-August vacation, their levels of participation decreased rather than increased. This indicates that there are other barriers to participation. In addition to time, participants suggested personal/social, motivational/psychological barriers, mental barriers, cultural and technological barriers (Hew and Hara, 2007; Ardichvili, 2008). I will illustrate that these barriers did exist for different participants by citing reasons given by participants.

6.1.7.2 Cultural Barriers

Barriers related to cultural behavior have been identified as significant in the way knowledge was shared with others. Trinidad teachers have had a history of a top-down approach to professional development. They have not had opportunities to participate in professional development as and when they wish and were usually selected for training instead of opting for it. While teachers have expressed a desire to engage in more democratic forms of professional learning activities, they seemed hesitant to maximize the benefits of this opportunity.

In terms of school culture, teachers in Trinidad and Tobago get two (2) months of paid vacation in a system where teacher professional development is encouraged but not supported, either through fiscal incentives, licensure or mobility. As such, the common view is that teachers are on holidays from school and hence school-related activity.   Teachers explain that "this is my time" (Angel), and this may explain decline in participation during the July-August period of the study. Only Lusha and Yemi-J were active during this period, and this signals differences in teacher professional identity and motivation. My findings did

not indicate that teachers made any significant shifts in cultural norms and conventions though the affordances of Web 2.0 tools while collaborating on this SNS, even though this finding was presented in a study on SNS using a COP perspective (Gunawardena et al., 2009).

Trinbagonians are also acculturized to looking in at others without actually getting involved themselves. This is locally called 'macoing' or 'minding odder people bizness'. I show an example of a comment that identifies this aspect of our culture.

> Derek Haqq: "Well, I think for most trinis, it's the digital form of macoing. Most of us in Trinidad lurk on social websites to look for people they may know or have just met, just to see what they are saying."

The use of the term 'lurk' is familiar to Derek and he sought to explain how he thought most persons on the site participated. The idea of digital 'macoing' seems to accurately describe how and why participants acted in the role as readers. The term 'maco' is a Trinidad and Tobago word which usually refers to someone who 'minds other peoples business' by spying on the person (Mendes, 1985, p.120). The term also refers to 'gossip'. As such 'macoing' is the act of spying or looking at others while they go about their daily lives. While the official language of Trinidad and Tobago is Standard English, the spoken and sometimes written word often incorporates Trinidadian lingo. The use of dialect in this example shows the ease that participants felt in expressing themselves with local language and feeling understood. This supports the need for a website that is localized to Trinidad and Tobago where participants can feel comfortable to use everyday language.

6.1.7.3 Personal/Social Barriers
Participants also identified personal/social barriers to participation. Angel and Steve gave the following reasons for their levels of participation.

> Angel: "It is difficult for me to participate in a strange setting because of my personality. I think that I am an introvert. I also believe that because we were mainly exposed to a teacher centered approach of learning as students, it may be difficult for us to actively participate even now as adults because we are not accustomed to this "new" approach."

Angel: "It is easy to sit back and watch & listen to conversation, learning the entire time. Sometimes I (am) unsure of the value of my contribution. Sometimes the conversation seems to be between you and Yemi-J and I don't want to butt in."

Steve: " I have found lack of opportunity to participate"

Reasons for difficulties in participation resulted from resistance to change or due to teacher personality differences. Ottenbreit-Leftwich, Glazewski, Newby and Ertmer (2010, p. 1322) suggest that 'teacher beliefs are defined broadly as "tacit, often unconsciously held assumptions about students, classrooms, and the academic material to be taught" and that beliefs have more influence on teacher practice than teacher knowledge. Bai and Ertmer (2008) found that teachers' beliefs about teaching and learning might play an important role in the ways in which technology gets used in classrooms. It is important to look at some of these barriers more closely in order to design opportunities for teachers to become effective in the classroom. For teachers to move from their current attitudes to using Web technologies, they need to shift to a more constructivist perspective to teaching, which is claimed as more appropriate for effective technology use (Palak and Walls, 2009; Zhou et al., 2007).

6.1.7.4 Motivational/ Psychological barriers

MOE officials indicated that low levels of interest were a factor in levels of participation. The following comment by Ingrid seems to reflect this position.

Ingrid: "Low participation in these sessions may also be attributed to a lack of motivation amongst participants"

Maslow's hierarchy of needs is helpful in understanding that participation in online communities is affected by the actor's beliefs and interests (Bishop, 2006). The site *TrinbagoTeachersUsingTechnology* was created to promote interactions among teachers with special interest in using technology in their classrooms. It can be understood that not all curriculum officers in the MOE would share in this interest, even though it is part of their work portfolio, but teachers who volunteered to register on the site indicated that they wanted to 'find colleagues of similar interests'.

6.1.7.5 Mental Barriers

Participants' comments also indicate that individual differences are significant to online participation. These two comments have indicated differences in how new information is

processed and that time is needed to internalize it. These comments may point to communication styles as well differences in cognition.

> Angel: "If the information being shared is new to me, I will not feel comfortable to respond. I need time to think about it".

> Yemi-J: "I think everyone needs their own time to process information. While it may seem that people are 'lurking', they may be simply turning the material over in their minds until they feel that they want to contribute their thoughts. Same as with many discussions face-to-face. Everyone is different. While you think that these people may somehow be hitch-hiking without contributing, there is no telling what they will provide in their own time later".

Based upon studies on online intercultural communication, Reeder, Macfadyen, Roche, and Chase (2004) suggested communicative style (predisposition to participate), participant structure (appropriateness of context) and genre (acceptability of) are conditions for online communication. Critics of social learning theory indicate that the theory does not take into account individual differences in a social learning environment and there is evidence that even in a socially mediated environment, individuals can learn differently (Salomon and Perkins, 1998).

6.1.7.6 Technological Barriers

Another factor indicated by participants is difficulty in using the tools on the site. Technological ineptitude (Ardichvili, 2008; Cuban, Kirkpatrick and Peck, 2001) and technology barriers (Hew and Hara, 2007) have been found in the literature. There have been several instances where the technology itself seemed to have negatively affected teachers' participation. I will now show a few examples to illustrate this.

In this first example, I highlight contents of an email with an unregistered participant.[1]

> "Date: Wed, 31 Aug 2011 13:34:04 -0400
> Subject: Re: RE: You have been invited to join TrinbagoTeachersUsingTechnology
> From: vjkamal@gmail.com
> To: carolynsumadh@hotmail.com
> Hi.
> sorry to learn that. I did not know why you were not on even tho u keep saying that u accepted the invite.

---

[1] The contents of the email are unaltered and so the spaces and fonts are that of the original document.

Do u have another email that I can use?

Vimala

On Aug 31, 2011 12:36 PM, "CAROLYN SUMADH" carolynsumadh@hotmail.com wrote:

>

> Hi Judy, When I click on the link, I keep receiving the message that the site is blocked.

>Carolyn

> Subject: You have been invited to join TrinbagoTeachersUsingTechnology

> From: vjkamal@gmail.com

> Date: Tue, 9 Aug 2011 09:43:30 -0400

> To: carolynsumadh@hotmail.com

>

> Hi carolyn,

>

> Please join me on TrinbagoTeachersUsingTechnology.

>

> To accept my invite and to automatically be added as my friend please click the link below:

>

> Yes, join TrinbagoTeachersUsingTechnology and become friends with vimala

> I hope to see you soon! "

In this email, the invited teacher indicated that the site was blocked and was unable to register. This prevented her from registering at all even though she had accepted an invitation to participate. This may explain as well why other invited teachers may not have been registered as site participants.

In the next example, I show the contents of the two chats with mislezama which indicate the difficulties she had with Internet access to continue the chat. In the first example, I tried to start a chat with mislezama but she did not reply. This was in the morning period.

Chat 1
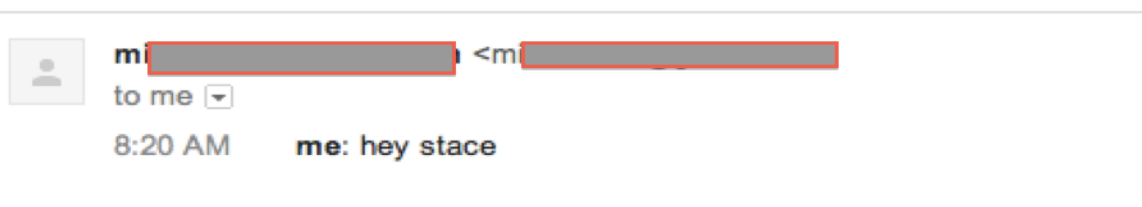
In the second example, (Figure 6-2) I was able to chat with the same participant for a longer time as I was engaging her to start a collaborative event with me on a wiki. We used Google chat. In this example, I had a lengthy chat with the participant but most of it was related to technical issues. I tried to start a chat with her in the chatroom of the *techtalk.spruz.com* site to work on a wiki site collaboratively but she indicated that she had connectivity issues. I had

planned to use Google talk tool using her *Gmail* account but to no avail. As such the chat ended soon after without being able to collaborate on the wiki.

Chat 2
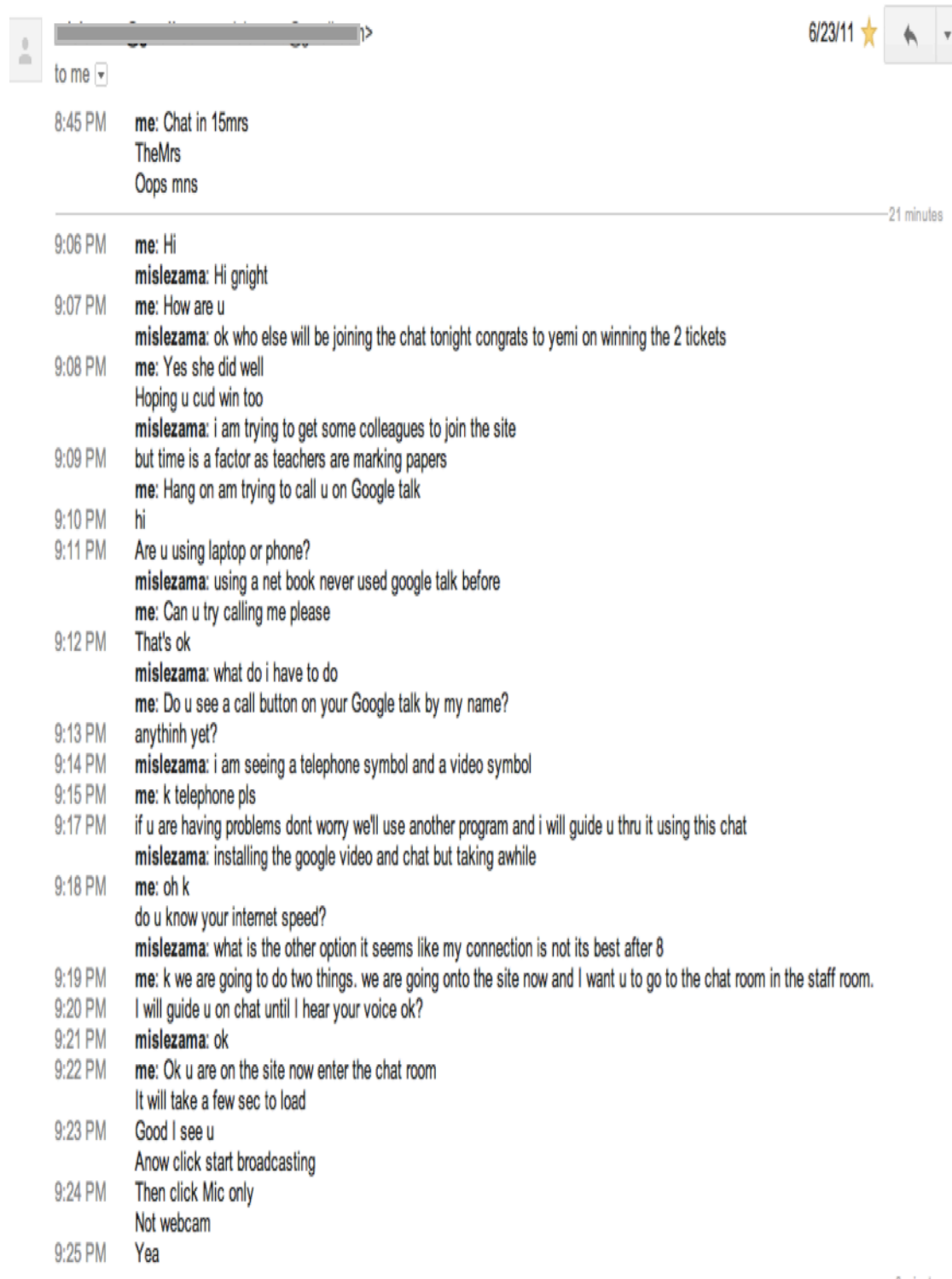
Figure 6-2 Chat 2

These two chat examples show that even for registered participants, Internet connectivity and navigating the tools on the site were barriers to maximizing participation on the site, even when the participant was willing. Recent media reports indicate that local Internet usage in Trinidad and Tobago is above 50% but the last official Digital Divide report indicates just 17% for Internet penetration (Ramlal and Watson, 2007). Internet access and confidence in using technology tools (Bingimlas, 2009) are significant in teachers' participation.

6.1.8 Summary of Findings for Research Question 1

These findings show that this SNS allowed the embedding of both asynchronous and synchronous Web 2.0 tools that afforded participants a number of benefits. The combination of these tools afforded site participants opportunities to connect, share and learn from each other. Participation took place across time and space, (Davies, 2006) school and curriculum area and teachers interacted with those who were previously unknown and distant (Lee & McLoughlin, 2008). Findings indicated that this SNS allowed for social, participatory processes, which were democratic (Conole, Galley and Culver, 2011; Lieberman and Mace, 2010) as participants exercised control of their experiences on the SNS and selected activities of their choice in which to participate. Some participants engaged more fully than others, but the majority participated minimally. One teacher participant emerged as a leader on the site, having performed mentoring, and networking roles among others. MOE officials did not participate as fully as desired. Several barriers to participation have been proposed which are supported in the literature. Several of the barriers to participation echo that of barriers to teacher technology change as described by Ertmer (1999) and Lim and Khine (2006). These barriers have been found to be time, personal/social, motivational/ psychological, mental, cultural and technological. I have used these barriers to account for differences in participation levels on the site and the eventual roles played by participants, which I identified as window-shopper, content consumer and producer, collaborator and leader. Ardichvili (2008) suggest that some of these barriers can be overcome through development of trust in the environment, a supportive learning culture and the affordances of Web 2.0 tools. These findings allow me to problematize the power of Web 2.0 tools as 'social and participatory' (Conole, Galley and Culver, 2011), if participants do not feel that their contributions matter *or* that it is important to contribute to the shared space.

6.2 Research question 2: Are there benefits to teachers participating in an online professional social network?

In order to explore this research question, I used themes in sections 5.5.1 and 5.5.2. I found that participation in site activities afforded participants knowledge sharing, knowledge/information seeking, opinion sharing, opinion seeking, experience sharing, emotional support, emotional seeking, emotional sharing, self-presentation, exploring new ideas and reflecting on classroom practice (Hew and Hara, 2007; Hur and Brush, 2009; Pardo and Nussbaum-Beach, 2011). From these affordances, four major benefits to teacher participants were proposed (section 5.5.2) which are Expression, Exploration, Reflection and Socialization.

The following diagram (Figure 6-3) was designed to portray the connections among affordances and benefits to participants through using embedded Web 2.0 tools on the site. These benefits illustrate four distinct ways that teacher participants were able to harness the affordances of Web 2.0 tools to their advantage. They cater to interpersonal as well as intrapersonal interactions and allows for personal self-reflection as well as the desire to interact with others. This diagram also shows that two divergent aspects of human behavior, exploration and expression are both facilitated through site activities.

6.2.1 Benefit 1: Expression

6.2.1.1 Knowledge Sharing

One of the recurring observations in teachers' discourse in activities such as blogs, wikis, discussion forums, chats and media sharing is knowledge sharing. The participant shares something that he/she already knows on a certain topic. The participant adds content to the site by sharing this knowledge and contributes actively to site content. In analyzing these postings further, I found that knowledge created on the site fell into three main categories which were content knowledge, pedagogical knowledge, technological knowledge which are categories are aligned to the TPACK model (Harris, Mishra and Koehler, 2009). I found these categories to be useful to my analysis as the site was designed to support teachers' integration of technology in the classroom. Knowledge was produced in multiple formats such as text, photos, videos, hyperlinks and diagrams.
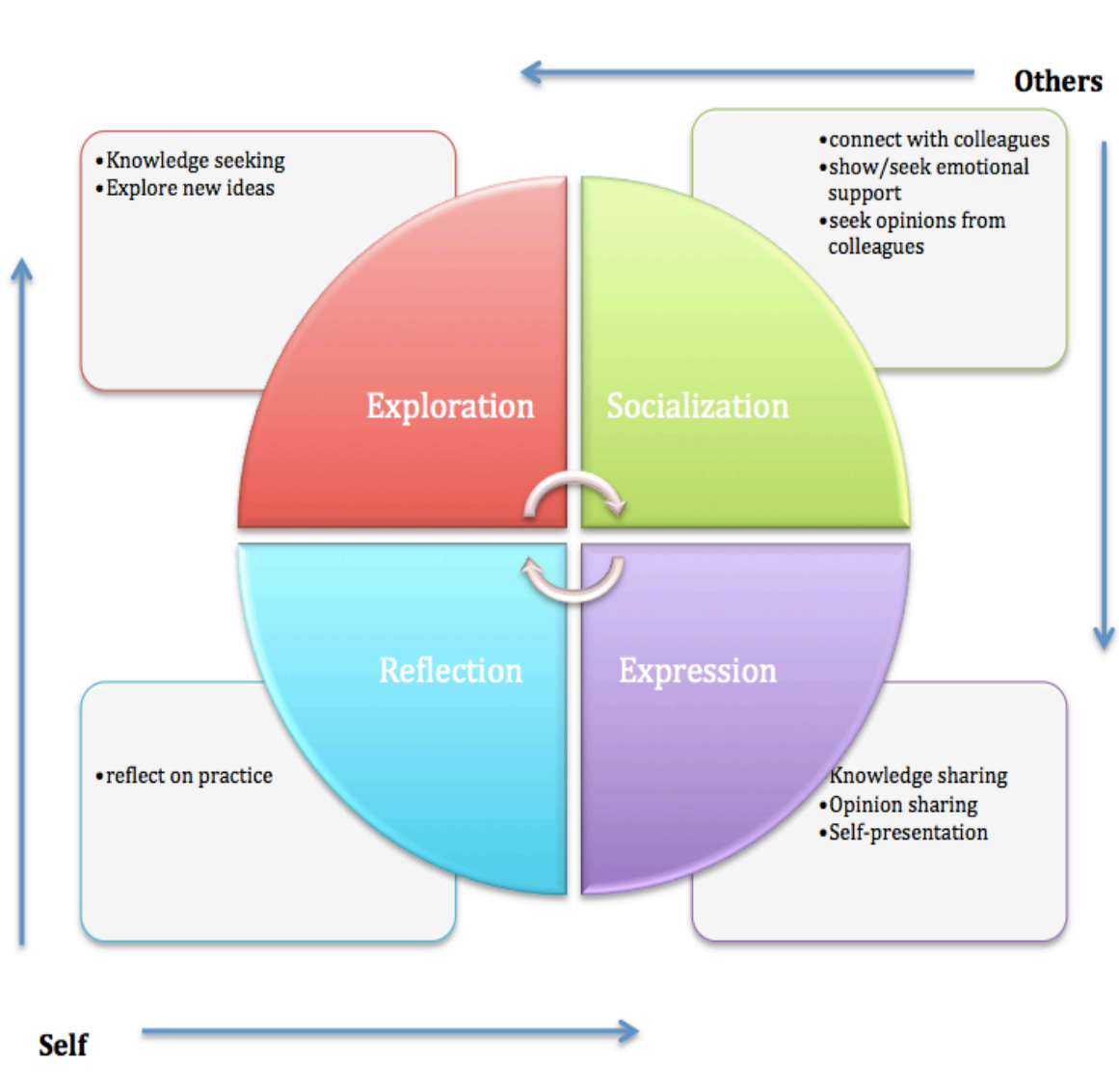
Figure 6-3 Relationships among SNS Participant Benefits

Examples where content knowledge was shared occurred when Annoushka uploaded her lesson plans, Yemi-J inserted 'Dale's cone of experience' in her wiki and Yemi-J made a comment on her blog post in which she talked about her students' mistakes.

> Yemi-J: "Well, certainly you do get some interesting responses from students during exam time, this one I found particularly funny -a form 1 student was asked to give a negative impact of tourism on the environment and to offer a solution. His answer: Tourism can contribute to deforestation, as land is cleared to build hotels. To solve this problem we should ask the tourist to bring a tent with them instead."

In the next example, hyperlinks to sites where Spanish language can be practiced were uploaded on the Spanish forum page by Lusha.

Figure 6-4 Lusha's Spanish Forum post

Pedagogical knowledge was shared when participants were discussing a strategy they used or planned to use in the classroom. In the following example, Lusha published information on how she planned to conduct her new Music project:

> "Last night I started working on a Music Project I have had in mind for my Form Ones …The Proposed Project: to interview a grandparent, parent or guardian about the type of music they listened to when they were your age. Please follow the link to the proposed Project Questionnaire <hyperlink given>"

There were few examples that addressed a strictly technological issue. The three examples chosen share some technical aspect to the technology being discussed. In the first example, features of PowerPoint are shared while in the second example; the state of Internet access in the school is presented.

> Derek Haqq: "For the most part the presentation depicted uses static images with callout shapes (the text bubbles)."

> MsWight: "Again, teachers have access to the Internet, NOT STUDENT LAPTOPS... In fact, the network struggles to accommodate the load and this is with respect to the staff servers... student servers continue to have configuration issues which MOE still has not resolved... With respect to speed... one word 'SLOW'."

In this third example, Stace (mizlezama) and I were using Google chat. During the conversation she revealed aspects of her technology use.

> Me: "Are u using laptop or phone?

> mislezama: using a net book. never used google talk before"

The findings above show that knowledge shared on the site could be categorized into three distinct areas. However, I have found that a significant number of site postings fell in the category of technological/pedagogical knowledge. I will use three examples to illustrate this. Derek Haqq shared a PowerPoint video presentation to show how certain features in a PowerPoint tool can be used in education:

> "This is just a simple example of how you can use PowerPoint animations and transitions in a movie-style presentation to support or enhance training/ educational initiatives."

In another example from Lusha's blog, she suggests how she thinks Googledocs can be used in her upcoming classroom project.

> "I was looking at all the different things you can do with Google Docs and was particularly interested in the fact that it enabled me to do a template for an interview idea I have had for a while. What I particularly like is that Google Docs can do a summary of all projects submitted."

The next example shows a photo uploaded by Yemi-J (Figure 6.5), which I have selected to show a non-written example of an artifact. This photo shows students using laptops in a pair and share method in a geography class. This photo is valuable as an artifact as it captures actual classroom practice about how a piece of technology has been used in the classroom.

These findings show that teachers engaged in various site activities and produced knowledge that can be described as local. Online social network sites can support enhanced communication among teachers, which allows for knowledge sharing (Sinha, et al., 2010). Knowledge sharing was facilitated through a variety of web tools and took the form of

written text, multimedia forms as well as hyperlinks. Knowledge could be categorized along

Figure 6-5 Non-text artifact-a Picture

TPACK lines and suggest that the content added is valuable in allowing teachers to share what they knew, experienced or felt. In all instances, the knowledge shared was contextual and related to professional practice, as such the site was useful in producing situated knowledge (Nicholls, 2009).

6.2.1.2 Identity performance/Self-Presentation

User profiles were created upon registration and hold a range of information, but only user name, user photo and date of last activity are displayed on the site publicly (see figure 6-6 below). Members generally completed their profile pages. In the majority of cases, registered participants used their first name as their username. The following examples show a case with first name as username and then first name and surname as username. Annoushka and Derek Haqq are typical of usernames chosen by teachers and their selections would suggest that participants were not afraid of using their real names and wanted to be known by these names. This suggests that teachers wanted to establish their professional identity on the site. Six participants used a username that was different from their real names. These are Agritech, Angel, Real1, Techsavvy, Lowmay and STGEEDTECHIE. These findings suggest that these participants may be uncomfortable with releasing their real identity. It is possible that they are part of social networks where they are accustomed to using a different username or they were unsure what would be possible implications with their employers in using their real

names. Of these names, Agritech, Techsavvy and STGEEDTECHIE reflect the curriculum areas to which these participants belong namely Agriculture Science, Information Technology and Technology Education. The other three names do not appear to have any significance to their teaching profession. The third name in the screenshot example selected below is one of these six names.

Figure 6-6 Screenshots showing different usernames

These findings indicate that teacher participants on the site were able to express themselves by sharing knowledge, opinions and experiences. They also had opportunity to present themselves online to their colleagues in a way they felt comfortable. As such teachers can benefit from participation on this site by being able to select a number of different ways to express themselves, without being space or time bound.

6.2.2   Benefit 2: Exploration

While themes of knowledge-sharing recurred throughout the site regardless of activity type, there were concurrent themes of knowledge seeking. The site allowed teachers to enter different rooms to see what was happening in different activities. Findings on the site indicate that teachers wanted to explore new ideas through discussions in blogs and forums, wikis and chats and to learn something new by taking an online course or asking questions related to practice.

6.2.2.1   Explore new ideas

A number of postings seem to indicate that the teacher was exploring a new idea and seemed to be aimed at improving classroom practice. Participants were 'thinking out loud' as it were, and sometimes they sought advice and opinions from colleagues. In this example, Lusha

posts a blog comment in conversation with Yemi-J and myself in the blog post "My first Google Docs Document". The screenshot below shows Lusha exploring how students could use multimedia technology in their music presentations.

Figure 6-7 Yemi blogpost

In another blogpost, Lusha responds to a request by Yemi-J for feedback on using PowerPoint presentations more creatively. Here, Lusha explores a new idea related to Pitchlake folklore. I have included this example because Geography is Yemi-J's content area and not Lusha's yet she was able to make a suggestion, which could help the original poster to explore her ideas on creativity, further.

Lusha (Aug 24th 11)   **Reply / Delete**

I read something recently...the folklore of how the Pitch Lake got it's name...It would be nice to see the kids working on presentations like this that includes building their creativity.

Figure 6-8 Lusha blogpost

In a Forum post in Mathematics called 'The New Interactive Math classroom', Rosanna commented on an article that described how a classroom teacher had made Mathematics exciting by using a lot of interactive technologies.

"Not yet but as the first formers move up into third form with their laptops, I can foresee classrooms eventually looking like this one. Teachers & principals have to come on board and be more conducive to this kind of approach."

This comment indicated that Rosanna was 'thinking aloud' about a classroom like the one described in the article could be realized in her school in the future with students having laptops. She furthered her thinking by suggesting how other stakeholders would be critical to the success of these new classrooms.

6.2.2.2   Knowledge seeking

A number of activities simultaneously allowed knowledge exchanges among participants and there were a number of examples where participants were seeking knowledge of some kind. Those wanting to learn something new did so by enrolling in an online course, or by asking questions on a blog or forum post. Questions were also asked in online chats.

Participants could have accessed three online courses, *Google docs, Lesson Planning* and *Differentiated Classrooms* that were supported by a free online course platform *Udemy* (see screenshot below, Figure 6-9).

Figure 6-9 Online courses

These courses were designed by me primarily for site participants but could be accessed by non-site participants who had membership in Udemy. Over time, I noticed that most of the persons enrolled were from the public and not site participants and this was an unexpected outcome of this study. It seemed that using the publicly accessible Udemy platform allowed access to this course and hence a larger number of persons enrolled than was expected. The Lesson Planning course was the most popular to date.

An additional benefit to those who enrolled in a course was the ability to explore new ideas presented. The example below (Figure 6-10) shows a snapshot of site participant, Stace's comment where she explored how a resource document presented in the course, Lesson Planning, could be used in her school context.
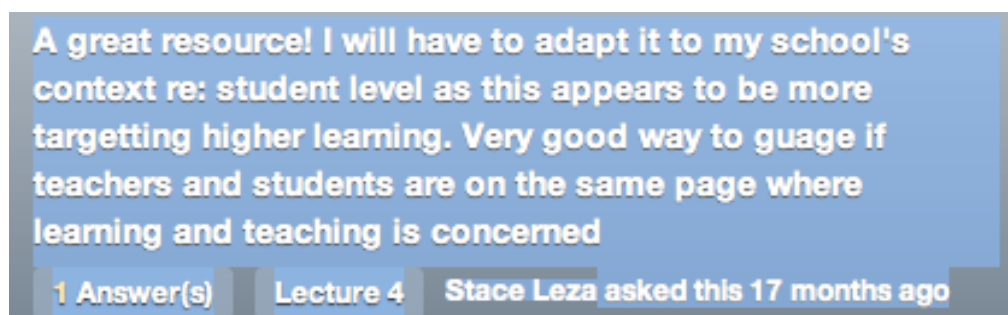
Figure 6-10 comments made about online course

There were several examples in blog postings where direct questions were asked.

Example one is part of a blogpost by Yemi-J in a response to Lusha. This question was related directed to Lusha requesting information about a specific piece of technology.

Yemi-J: "Where did u find a site to allow you embed the pieces like that?"

Example two illustrates a question posed by Stace in the ICT technology forum.

Stace: "Anyone experiencing issues with their IT Technician?"

In other instances, an opinion may be sought instead of a piece of information. The following examples indicate this. Example three is part of Derek Haqq's comment on his video where he sought teachers' opinions on his uploaded self-created videoclip.

"…but hopefully the more creative of you out there will appreciate the idea and come up with some better examples. Feedback is welcome;…"

Example four is part of a posting under Spanish in the Curriculum Forum by Lusha where she sought teachers' opinions on her suggested resource sites for Spanish (refer to figure 4).

"Let me know what you guys think so I can recommend the site to my kids."

Looking at the four postings selected more closely, I observed differences in responses to questions or direct requests for feedback. In examples one and two, there was a fair exchange of responses to the questions posed, but there were no responses to requests for feedback in examples three and four. Examples two and four show posts in the forum tool while examples one and three were posts in blog tools and media sharing tools. The forum tool is specifically designed to promote the posting of questions aligned to specific categories so that an expert in that area could provide support. The curriculum, technology and pedagogy forums were available to teachers to pose questions or raise issues of concern with respective moderators. There were several opportunities for experts in the field such as curriculum and education technology officers to respond to teachers' requests as moderators in these forums, but these were hardly seen. The following screen shots show the responses on all three forums (see Figures 6-11 and 6-12).

Figure 6-11 Forum categories

Looking at the forum topics, I want to highlight Lusha's post as the last post in Spanish and Visual and Performing Arts. There were zero responses to Lusha's request in both cases, example four above illustrating how she made that request. In contrast, a post started by Angel in the ICT category contained one topic, 'Internet access for Form 1 students', which seemed to generate high interest. The screenshot shows 8 replies and 162 views with conversations lasting about a month.

ICT   Recent Posts My Posts My Subscriptions

➕ **New Topic**   🔍 Filter ↕️ Sort 📋 Admin

(Showing 1 to 1 of 1 topics)   Replies   Viewed

❓ **Internet Access for Form 1 students** started May 19th 2011 by Angel   8   162
    Last Reply Jun 16th 2011 by vimala

                                                                          🔶RSS

Figure 6-12 Forum category ICT

Parts of the exchange on this forum topic are given below (Figure 6-13).

stace - Posted May 30th 2011   ⁶⁶ Quote 📗 Rate ✏️ Edit 🗑 Delete
                                                ✅ Propose as Answer

  Anyone experiencing issues with their IT Technician? What exactly is their job description? An IT Technician who says his job is not to tote and carry equipment or set it up for teachers...is this true?

Are teachers just being boldfaced if they wish to use technology in their class and they ask the IT guy to set it up before hand in the room they are using, stick around long enough to assist with any technical problems that may come up and then return later to take down, pack up and return said equipment to the storage room?

My Posts Any of this sound familiar or is it unheard of where you teach?
technology
Posts: 1
                                                                    Edit Signature

Angel - Posted May 30th 2011   ⁶⁶ Quote 📗 Rate ✏️ Edit 🗑 Delete
                                                ✅ Propose as Answer

  The IT technician at our school seems willing to do whatever he is capable of to help. He and his assistant set up equipment before
My Posts classes and return to remove the equipment-which is under their custody so it's only right that they take charge of it. We have many
technology technical problems at our school but at least the technicians are easily approachable.
Posts: 2
                                                                    Edit Signature

MsWight - Posted May 30th 2011   ⁶⁶ Quote 📗 Rate ✏️ Edit 🗑 Delete
                                                ✅ Propose as Answer

Well the IT technician at our school is always willing to assist and quite approachable. In fact, sometimes we share him with another school in the area as they are without a technician. So too, I have noticed that the Form One students and parents have
My Posts gravitated to him with their numerous computer concerns. I personally do not know the job description of the IT technician but I
technology usually set up my equipment with the assistance of the technician, if need be. However, I have seen him setting up equipment for
Posts: 3 teachers who were not in the know.
                                                                    Edit Signature

Figure 6-13 Forum discussion on ICT technician

Here, Stace poses a direct question with some emphasis. Colleagues responded positively, sharing knowledge of the issue relative to their context and their current experiences. Both responses by Angel and MsWight seem to give a contrasting view to the scenario presented by Stace. As such, Stace was able to get feedback to a concern she had. The forum seemed to provide opportunities for teachers to explore new ideas in terms of improving practice, as was highlighted by Rosanna in the Math forum, and to seek knowledge, as highlighted Angel's and Stace's post in the ICT forum.

These findings indicate that both content knowledge as well as opinions were sought by participants, either when they shared a new idea or information they had and wanted feedback from colleagues. Sometimes participants wanted a specific answer to a posed question on technology use or responses by colleagues on similarity of experiences with other teachers and schools. It seems that the idea of reciprocity (Usoro et al., 2007; Hew and Hara, 2007) facilitates exchanges of knowledge, especially in conversations where there is a post, a response, then another response. This is particularly highlighted by the topic in the technology forum. So, knowledge-sharing often took place together with knowledge-seeking (Phang, Kankanhalli and Sabherwal, 2009). As such, teachers were co-producers and co-consumers of content on the site.

There was one response on the topic in the ICT Technology forum "Internet access for Form I's" by Derek Haqq, MOE's education technologist and his response is shown below.

Figure 6-14 Derek Haqq's response

In examining Derek Haqq's response, a new tone and direction is introduced in the discussion on 'Internet access for Form 1's'. His tone contrasts that of earlier respondents Stace, Angel

and MsWight. In his response, Derek Haqq asked teachers to think about solutions to challenges presented and steered the conversation away from complaining to that of teacher and school responsibility. His motivation to respond could be attributed to what Hew and Hara (2007) describe as collectivism, where the participant simply wishes to add his thoughts to the conversation. But I wish to add responsibility to the set of motivating factors described by Hew and Hara (2007), as I feel that perhaps Derek Haqq felt a sense of duty to correct perceptions shared by teachers on the particular ICT issue. This factor is partially supported by Ardichvili (2008) who suggest that knowledge is shared for enhancing professional identity and a need to be perceived as knowing. There were no further responses by teachers to the question posed by him in the third paragraph above. I added a comment to the forum topic one month later with a hyperlink to a local newspaper article addressing the topic to expand understanding of this ICT issue, as I too, felt responsible for shaping teachers views.

Some of the less obvious ways that participants could have gained new knowledge was in lesson file downloads and in viewing postings. Teachers were able to scan available lessons in different curriculum areas and download those they wanted by clicking the 'download file' button (see figure 5-21). It is anticipated that participants who downloaded lessons would read it.

The number of views in the 'recent forum posts' the 'blog entries' screens on the homepage is an indicator that participants were viewing these postings, possibly in search of something new to learn. The example below, figure 6-15, is a screen shot of the homepage showing views and comments on forum posts.

Recent Forum Posts			
Topic	**Views**	**Replies**	**Last Post**
Go Animate Presentation	7	0	No Replies
Link to Spanish Websites - Please check it out	10	0	No Replies
Internet Access for Form 1 students	163	8	Last Reply Jun 16th 2011 by vimala
steel pan website	3	0	No Replies
The New Interactive math Classroom	31	3	Last Reply May 29th 2011 by vimala

Figure 6-15 Forum posts

I have observed that there were always a larger number of views than comments and differences in the response by topic. In some cases, teacher participants' responses were low, others high. Perhaps the tone of the questions posed influenced the rate of responses or

interest in the title of the topic itself. In the case of low viewership, and contribution, participants chose not to respond or share their opinion. Generally, responses to my posts or that of other teachers came from either other teachers or myself. Experts in the MOE rarely offered responses. The number of views is an indication that participants have clicked the topic and read the post(s) or part thereof. As such, through reading, knowledge is gained.

The discrepancy between the number of views and replies highlight a continuing debate on what constitutes participation and whether learning takes place if the participant only views a post instead of contributing to it with a reply/comment. The high number of views of the topic 'Internet access for form 1 students' brings support to Hrastinski's (2008) view that reading is not passive and learning may take place through reading others' dialogs. This was discussed earlier.

Findings in this section suggest that teachers had opportunity to ask questions related to practice and to seek opinions from colleagues and experts. Teachers used a variety of pathways such as blogs, videos, discussion forums, online course enrollment and lesson file downloads and viewing of posts to seek new knowledge and sometimes to explore new content and ideas. Knowledge sharing often accompanied knowledge seeking, whether in the form of a direct question or comment. Teachers responded to other teachers depending on the topic and knowledge seemed to flow more easily if a direct question was asked, but less so on a new idea. MOE experts had minimal participation and did not provide expert advice to teachers, as I had anticipated, except for Derek Haqq. As site administrator and researcher and moderator, I tried to respond to teachers' queries and so I contributed the last response in many postings. In many cases, I enjoyed contributing and did so for the sheer joy of it, a somewhat altruistic view already suggested by Hew and Hara (2007) but in other cases, I felt compelled to do so when other MOE experts did not participate.

6.2.3 Benefit 3: Reflection

There were a few posts where teachers offered comments that were reflective of their classroom practice. These were facilitated through discussions in blogs, forums, online chats and in media sharing. I will select one example from each of these activities.

Example one shows a response by Yemi-J to a blog post on Assessment where she reflects on how she evaluates students' comments. A screenshot of the post is used.

> **Yemi-J** (Jun 23rd 11) **Reply / Delete**
>
> Ofcourse I evaluate the comments they post. I don't use a numeric scoring rubric however. I evaluate based on the level of thinking the comments display. What kind of questions they ask, the depth of their responses to questions, the frequency with which they participate etc.
>
> My main goal is to bring them to a new understanding of what learning is. To move them away from thinking strictly about equating learning with grades.

Example two shows Lusha's post when she opened a new forum topic under Spanish curriculum area and reflected on her role as Assistant Form Teacher and what she could do to provide her students with resources (technology) to help them in that subject, even though this is not her specialty area.

> Lusha: "I am not a Spanish Teacher nor am I particularly good at the language. As the Assistant Form Teacher to a class where my girls are having a lot of trouble with the language, I did some research and came across a couple of websites that I think are helpful. Please see links below…"

Example three shows part of an online chat conversation between Yemi-J and myself (me) on 28/6/11. She started to share with me about starting a new wiki because of a difficulty she noticed with one of her students. The informal chat space allowed her to share her thoughts on the student and what she could do to improve her practice.

> **yema.jaikaran**: Ok
> well…i am going to work on an article for the wiki, called making connections
> 6:23 PM **me**: I think i also sent out a email Sunday…
> **yema.jaikaran**: i realised one of my students that is his problem he has difficulty making connections
> so i have to design an eniture set of worksheets now specific to his problem.
> **me**: between topic areas?
> **yema.jaikaran**: yes but in general between text
> **me**: ie not integrating content?
> 6:24 PM **yema.jaikaran**: welll….text vs images.

Example four shows part of a post by Derek Haqq in media-sharing.

> Derek Hagg: "I used this as part of a training session both with a group of IT students and with a team of personnel within an IT department as a mechanism for reinforcing the need to truly understand a problem before attempting to solve it using information technology (or any other means)."

I chose this example as it highlights reflection by a MOE official on his practice as a trainer. As an educational technologist, he used his experience to illustrate how a technology tool could be used. This contribution helps to expand the possibilities of how participants were able to use the site to become reflective practioners- teachers, curriculum and technology officials as well.

Findings in this section suggests that forums (Borko, Whitcomb and Liston, 2009), online chats (Loving, Schroeder, Kang, Shimek and Herbert, 2007) and discussions in media sharing tools can allow similar affordances to blogs, which are well-known for promoting reflective practice (Ray, Hocutt and Patterson, 2006; Deng and Yuen, 2011). Yet, I did not find extensive evidence of reflection on these blogs, even though teachers had time to reflect on what the issue was about. A number of tools did facilitate interactions through posting and responding along a topic of professional interest. Participants seemed to have some latitude in selecting a topic and revealing what and how they were feeling and thinking. Only forum topics were aligned to three broad areas but there was significant latitude there as well. In three out of four cases, teachers chose to share a solution that was technologically driven- websites, wikis, PowerPoint video presentation. This showed that teachers were able to reflect on how to integrate technology effectively in the classroom, an issue of professional practice.

6.2.4 Benefit 4: Socialization

A significant number of posts in blogs, forums, discussions and online chats indicated elements of seeking emotional support from colleagues and sharing emotions. Statements made by a poster or responder usually involved appreciation or encouragement.

The example below highlights portions of a conversation between Yemi-J and Lusha in a blogpost called Experimenting with PPT.

Lusha (Aug 24th 11)   **Reply / Delete**

I can really see the kids falling for this... I think they would love to try one for
themselves. I love it Yemi...

Rate ▬ 0 ➕

Yemi-J (Aug 26th 11)   **Reply / Delete**

Oh I love the Pitch Lake Story! I remember reading it in West Indian reader
as a child. !

These emotions are positive and Lusha is expressing some level of excitement about the ideas put forward by Yemi-J.

This next example shows part of a conversation between mislezama and myself in a Google chat on Jun 19, 2011.

8:57 PM	**me**: Hi Stace
	mislezama: hi vimala
8:58 PM	**me**: How are you? welcome
8:59 PM	**mislezama**: great can't wait for the session tonight

Mislezama expresses some degree of excitement and anticipation about participating in the chat session.

Sometimes, emoticons are used for emphasis in text conversations. This example shows how Yemi-j used it.

5:54 PM	**me**: hi
5:58 PM	**yema.jaikaran**: Hey :)
	HOw are u?
	me: Good how was your day?
5:59 PM	**yema.jaikaran**: lol busy :P, how was urs?

This chat showed how she used two different emoticons to show positive emotions including joy and excitement about being part of the chat.

In contrast, this forum post by Stace seems to express anger and frustration on the job, all negative emotions.

Anyone experiencing issues with their IT Technician? What exactly is their job description? An IT Technician who says his job is not to tote and carry equipment or set it up for teachers...is this true?

Are teachers just being boldfaced if they wish to use technology in their class and they ask the IT guy to set it up before hand in the room they are using, stick around long enough to assist with any technical problems that may come up and then return later to take down, pack up and return said equipment to the storage room?

Any of this sound familiar or is it unheard of where you teach?

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In the next forum post in ICT, MsWight used capitals in several parts of this post for emphasis on her point of view. It seems the teacher was somehow frustrated by the state of Internet access in her school. This post seems to be a complaint about MOE policies and practice.

In response to the "Internet Access in Schools" pdf... Though it may be politically correct to say secondary schools have Internet Access, most of this would have taken place during the SEMP initiative. At my school we are still operating on the initial WIFI setup... NO WIFI EXPANSION has taken place since the ECAL initiative. This project should have started since January we are approaching June and nothing has happened.

Again, teachers have access to the Internet, NOT STUDENT LAPTOPS... In fact, the network struggles to accommodate the load and this is with respect to the staff servers... student servers continue to have configuration issues which MOE still has not resolved... With respect to speed... one word 'SLOW'.

Schools have welcomed IT Technicians and see them as a valuable asset... But there is a growing concern amongst a number of technicians and principals. IT Technicians are contractually employed. It is observed that government employee contracts are not being automatically renewed. There is an indefinite 'waiting period' for the re-interview and selection process. This must cause some uneasiness amongst technician. I really hope MOE gets its act together for the success of this ECAL project.

6.2.5   Summary of findings for Research Question 2

Analysis of posts and activities on the site reveal that different participants engaged in one or more activities of their choice. Participation allowed a number of benefits to teacher participants, regardless of the Web 2.0 tool used to afford these benefits. Four major benefits to teacher participants were found which were expression, exploration, reflection and socialization, which were aligned to categorizations made by Selwyn (2008). These benefits were aggregated from affordances through Web 2.0 tools such as knowledge/opinion sharing, self-presentation, exploring new ideas, reflecting on classroom practice and combatting social isolation. Examples selected from the website showed that participants benefitted in a number of ways in just one post. Frequent posters stood to gain significant benefits by participating in a range of activities. Activities that enabled interactions among participants yielded discourse, which lies at the heart of knowledge contruction (Harasim, 2002). Discourses held on the site allowed participants to read and re-read what they and others wrote and according to Herod (2003, p.18), this provided "participants with the opportunity to review and reflect on what has been said and make more considered responses".

6.3 Research question 3: Can teachers' participation in an online professional social network lead to learning?

Findings, thus far, have shown that teacher participation varied in terms of time, location, choice of activities and roles played in those activities. Participants benefitted from participation in four significant ways: expression, exploration, socialization and reflection. In exploring whether this participation led to learning, I present five key findings on learning on this SNS based on teachers' participation across activities (Bakkenes, Vermunt and Wubbels, 2010). Participation in these activities allowed teachers to socialize, reflect on practice, explore knowledge and ideas and express themselves professionally. .

6.3.1 Learning was relevant to the learner and was situated in authentic practices

Activities were designed to suit the teaching/learning contexts of secondary schools in Trinidad and Tobago. Activities mirrored areas of importance to teachers who expressed an interest in using technology in their classroom. Discussions on the site were related to issues of teacher professional practice. Artifacts included photos and videos of students work, teaching materials, lesson plans, hyperlinks to educational sites, teachers' professional profiles and discussions related to practice. Issues such as 'Internet access for Form 1 students' were raised which were specifically related to Trinidad and Tobago schools. As such, knowledge-sharing and learning were intertwined in the context that teachers related to and led to the production of situated knowledge. It supports situated learning theory (where teachers engaged not only with content but also with colleagues (Boyle, 2008) in authentic activities which may be described as "activities that are similar to what practioners do" (Brown et. al, 1989 in Putnam and Borko, 2000, p.4).

6.3.2 Learning was constructed through participation in designed activities

The findings have suggested that local content was constructed on the site by a number of participants. However, most participants were consumers rather than producers. As shown in the last chapter in section 5.5.4, a significantly smaller number of participants chose to add content to the site. An even smaller number chose to exchange information and engage in discussions at length. As such, I would describe participants as being passive in their learning. I have already suggested a number of reasons for this passivity earlier in this chapter (section 6.1.7). I agree with the stance taken by Orlando (2011) that teachers exposed to ICT-supported, flexible and collaborative constructivist learning may change their attitude

and willingness to change their own practice. However, findings on this site support research studies that suggest that most teachers are not changing to constructivist practices (Windschitl, 2002) but rather have applied ICT to teacher-centred methods (Matzen and Edmunds, 2007; Warschauer, 2007). Their lack of constructivism is generally interpreted as resistance to change and Selwyn (2011) suggests that it is 'wishful thinking and speculation' to believe otherwise.

6.3.3 Learning was shared across the networking site and available to all participants?

Content on the site were in multi-media format such as text, pictures, video, chat logs, emoticons and hyperlinks and was accessible by registered and non-registered visitors. However, log-in access was needed to access certain activities such as posting comments, editing a wiki or taking an online course. Activities were organized within different webpages and movement through the website was achieved using a pull-down menu on the title bar. As such, content created by teachers were made public through the SNS (Lieberman and Mace, 2010). It can be argued that ease of sharing of artifacts and ease of access to other participant contributions can enable learning through reading. As such the affordance of sharing and access by all enables learning (Davies, 2006; Haythornwaithe and de Laat, 2010).

6.3.4 Learning was enabled through collaboration with others through Web 2.0 tools

Collaboration took place on the site in various ways. Collaboration is described as a participatory activity between two or more persons where there was a post, a response and then a response from the original poster. This took place synchronously as well as asynchronously, where there was a time difference in response. On blogs, forum discussions and media-sharing activities, collaboration between two persons or more took place almost immediately or over a period of a few days. Among the three real-time, synchronous tools on the site, online chats allowed for live talk and real-time interactions, enhanced communication among learners and increased a sense of familiarity in conversations (Loving, Schroeder, Kang, Shimek and Herbert, 2007). During collaborative activities, the name of the author, time contribution was made and the nature of the contribution was automatically captured and displayed allowing participation to be very public.

Collaboration has been argued by some researchers as a way to foster teacher learning (Bruce et al.,2010) and to battle persistent problems of teacher isolation (Darling-Hammond et al.,

2009; Lieberman and Mace, 2010). This SNS allowed many opportunities to collaborate using familiar and newer tools, yet several participants did not opt to collaborate. In several instances, they did not pursue conversations with myself or other colleagues, nor did they accept invitations to participate in real-time activities. The quality of Internet access seemed to have been a significant barrier to synchronous collaboration. In addition, participants have to agree to meet at a specified time, and with busy schedules, this was problematic. Liu and Miller (2011) suggest that teachers need to feel secure to share with each other and give constructive give constructive comments on each other's work. Free and easily accessible collaborative tools such as Google Docs are some of the newer tools available to teachers who wish to work together to create and publish a document, but there was little activity with this tool. It is perhaps because of its newness that teachers were unwilling to engage with it (Aarreniemi-Jokipelto, 2011). Wikis were a little more difficult to use than blogs or online discussion tools and only one person elected to participate in them. I agree with Selwyn (2008, p.8) that wikis "allow other users an equable right to edit and develop content in a common space" but did not find that they allowed for a higher degree of interaction than online discussion groups and blogs (Augar,Raitman and Zhou, 2004).

So while collaboration can advantage teachers in significant ways, it seems challenging to achieve (Wallace, 1999 in Bruce et al., 2010, p. 2) and barriers such as lack of trust, unfamiliarity of the tools and cultural and mental barriers may explain resistance to participate in collaborative activities.

6.3.5 Learning was enhanced by networking with others

Most participants were connected to me, as facilitator, in a 1-1 network format, but over time, a few colleagues expanded their networks by adding colleagues who they believed added value to their networks. Most participants did not, however, expand their networks. Perhaps, participants did not see the advantage in 'adding colleagues' as they had unrestricted access to content. This feature is similar to that of Facebook 'friends', which is a fundamental characteristic of SNS (boyd and Ellison, 2007). The site, hosted on www.spruz.com, allowed me to ensure that communication took place among participants and for the network to expand over time. Over time, participants interacted with others whom, I believe, were strangers to them prior to site activities. These teachers came from different schools, taught different subjects and were located differently and so the site allowed them to "meet" with each other, across space and time (Liu and Miller, 2011). This teachers' network thus enabled 'networking' (boyd and Ellison, 2007; Gunawardena et al., 2009).

6.3.6 Summary of Findings Related to Research Question 3

I have found that this SNS allowed teachers to connect, collaborate and support one another in an open and free online space, while creating new content. In examining participation on this site, I have found that learning evolved as participants changed the ways they interacted on the site and that participation was fluid and dynamic (de Laat, Lally, Lipponen, and Simons, 2007; Khoo and Forret, 2011). Participants engaged fully at a certain times or periods of time and this can be interpreted as active learning. They were able to use a combination of Web 2.0 tools that supported and encouraged individuals to learn together while retaining individual control over their time, space, presence, activity, identity and relationship (Anderson, 2008b, p. 227), which led to knowledge building that was shared and made available to all participants. However, teachers themselves did not indicate that they were willing to use SNS and/or Web 2.0 tools themselves with their students in their future practice. As such, their learning through Web 2.0 did not seem to change their practice or intention to practice using Web 2.0 tools. This finding does not support Albion's (2008) suggestion that "the best way for teachers to learn about Web 2.0 may be through learning with Web 2.0 as authentic practice that can inform their planning and implementation of learning activities" (Albion, 2008, p. 18)

Artifacts on the site revealed usable knowledge products, which were sharable and made thoughts and practice of teachers public (Lieberman and Mace, 2010). The site also allowed those considered as readers to observe the practices of active participants, whether it was engagement with a particular Web 2.0 tool or in a learning activity facilitated by that tool. Bakkenes et al. (2010, p. 536) suggest, "in principle, every activity can lead to a change in knowledge, beliefs or practices. Therefore, every activity can be a learning activity, even when a teacher did not have the intention to learn from that activity". As such, it appears that social learning theories support participation in a social network site and imply that there is a direct relationship between social participation and social learning theories.

The tendency to participate by reading and engaging in 1-1 interactions on the site seemed to favour individualized approaches to learning, even in a setting that enabled socialization and networking. But Saloman and Perkins (1998) point out that there is a tension between the "cognitive, acquisition-oriented" conception of individual learning and the "situative, participatory" conception in any learning space. Significantly, over time, interactions changed due to the role of an emergent leader on the site. This could be due to the increase in

trust among participants and increased familiarity over time (Usoro, Sharratt, Tsui and Shekhar, 2007; Dron, 2009; Tsai, 2011).

The site enabled interaction, collaboration, and contribution and participants in the space generated knowledge by co-creating, co-construction, co-authoring and sharing with others of their choice. The site has the potential to engage even larger numbers of like-minded, geographically dispersed individuals to participate in collective activities. This can lead to knowledge creation that is supported and aggregated on the web, which is often referred to as 'wisdom of crowds' (Surowiecki, 2004 in Dron and Anderson, 2007).

This site provided a ready-made avenue for teachers to select professional learning activities, publish new work or seek advice from colleagues and mentors thus battling teacher isolation, a problem cited by several researchers (Darling-Hammond et al., 2009; Lieberman and Mace, 2009) and thus challenges the traditional top-down approach to professional development. There was also evidence that the site allowed teachers to reflect on practice, which is a well-known component of teacher learning. However, not all adults are characterized as being self-directed learners as Brookfield (1986, p. 67) points out that "many learners within formal courses, classes, and programmes have stubbornly resisted the efforts of educators to transfer control over learning to them". I also did not find that teachers, in what may be considered as rural areas, advantaged themselves by participation in the site, thus the SNS did not give voice to those previously marginalized in traditional learning environments (Light, 2011). Perhaps this was due to technological barriers, but perhaps other barriers listed earlier were also significant. Further research can provide insights into these barriers to participation.

Based on participation patterns by teachers in this study, I support Dede's (2005, p.15.5) stance that "creating tacit, relatively unstructured learning in complex real-world settings is difficult" but, virtual environments supported by the affordances of Web technologies "can draw on the power of situated learning" by creating experiences that mirror that of the contexts of the real-world. Learning in online environments can be described as social, collaborative, consensual and negotiated (Harasim, 2002; Lee and McLoughlin, 2008). I accept Adler's (2000 in Borko, 2004, p.4) understanding of teacher learning as "a process of increasing participation in the practice of teaching, and through this participation, a process of becoming knowledgeable in and about teaching". Artifacts on the site indicate that teachers may have experienced a change in cognition through participation in activities (Bakkenes, Vermunt and Wubbels, 2010), but teachers barely reported changes in

beliefs/attitudes or changes in practice or even intentions to practice what was learnt. As such, I conclude that while situative learning theory seems to support the concept that participation can lead to learning, further research is needed to explore the extent of that learning.

Having described how participation took place on the site through a set of designed activities, I now suggest how learning was enhanced through this participation. I describe a set of characteristics that describe how learning can take place in an online social networking space. Diagram Figure 6-16 illustrates connections among these characteristics.

They are:

1. Learning can occur regardless of the geographic location of participants- work or home or other spaces
2. Learning is flexible across time allowing for delayed responses by participants
3. Learning can occur through the affordances of embedded asynchronous and synchronous Web 2.0 tools
4. Learning occurs through interactions with others
5. Learning can occur through reading and writing and doing
6. Learning is relevant to the learner and situated in authentic (teaching) practices
7. Learning can occur by increasing levels of active participation on the site
8. Learning is constructed through participation in designed activities
9. Learning is shared/distributed across the network, available to all participants and public to interested/selected audiences
10. Learning is enabled through participation in collaborative activities
11. Learning is enhanced by co-creating, co-construction, co-authoring and sharing with others
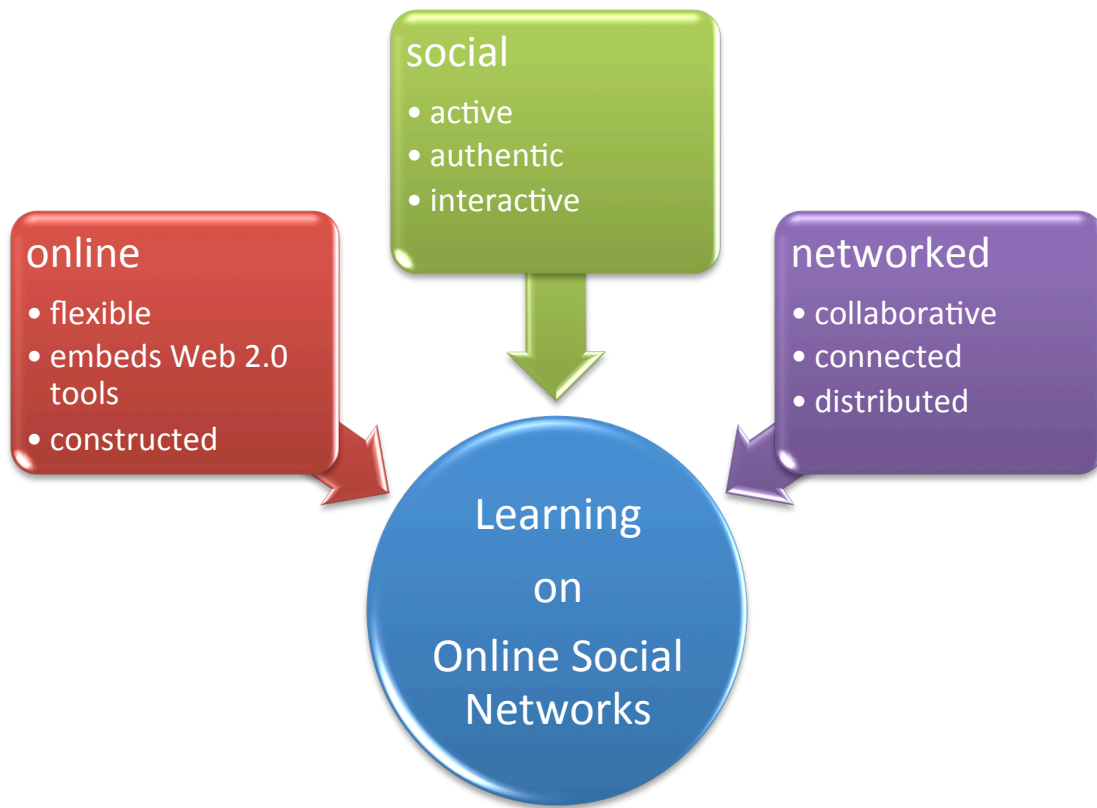
Figure 6-16 Characteristics of Learning in an Online Social Network

6.4   Unexpected Findings in the Research

At the beginning of the study, I had to make a decision about the degree of privacy that I allowed teacher participants on the site. Spruz.com allowed me to limit access to certain activities on a number of web pages. As such, the site, which is publicly available through Internet searches such as Google, can allow visitors to view content at will. This resulted in a substantially higher number of site visitors than I anticipated as well as the number of 'hits', while the number of teachers registering on the site was lower than expected. These teachers were the invited ones who were given a direct link to the site.

During the course of the study, participants felt that when they came onto the site, "they hardly saw anyone else on" (Yemi-J) and so I decided to use social media to give the site

more awareness. I placed upcoming events on my Facebook page and sent tweets as well through a new Twitter account. Prior to the study, I had minimal presence on Facebook and no Twitter account. I found a number of hits to the site from Facebook and over time, a number of followers to my tweets. The diagram below shows a screenshot of some of my followers on Twitter as a result.

Figure 6-17 Twitter followers to my site

I have realized that functioning as both a researcher and a participant was quite time consuming and mentally demanding. Managing this research demanded that I learn new skills, before, during and after the period of research. I had to learn how to select and use a variety of Web 2.0 tools and constantly adapt the online medium to meet teachers' needs. In addition, it involved administration of a website together with content creation. I also learnt how to create online courses and made these available on Udemy.com.

In summary, I have found that I was able to benefit tremendously from this research study by learning about Web 2.0 tools that I was barely familiar with before. In addition, I have recognized the immense power of the Internet, as it allows the expansion of viewership of a site located and situated in a small country like Trinidad and Tobago. It has allowed me to think that I can contribute to teachers' learning on a global scale, much like what Robertson (1995, p. 477) describes as the "local in the global". Making teachers' data public has allowed me to contemplate a more expansive view of participation on the site.

7 Conclusions

This study describes teachers' participation in an online social networking site called *TrinbagoTeachersUsingTechnology (www.techtalk.spruz.com)* over the period May-August of one academic year. It contributes to the body of research of how teachers, in Trinidad and Tobago, engaged in informal learning by harnessing the affordances of Web 2.0 tools to share knowledge, ideas and best practices as well as connect with colleagues. It contributes to an understanding of how teacher professional learning may be enacted in an ongoing, learner-centred online environment, which was underpinned by theories of online and social learning. In particular, situated learning theory has contributed to an understanding of how participation in social activities impacts learning (Borko, 2004). This study indicates that learning can be enabled among peers in non-traditional spaces and is enabled by Web 2.0 technologies and the study supports Dron and Anderson (2007)'s position that teacher professional learning allows for the construction of knowledge through bottom-up types of collaboration. In adopting different roles of participation on the site and through interaction with colleagues, there is some evidence that teachers can make a shift from individualized learning to shared learning, which was enhanced through communicative and collaborative Web 2.0 technologies on the site. More importantly, this study allows for debates on classical notions of learning and in particular, teacher learning, in terms of how and where learning can take place and on the significance of learning from experts in formal spaces (Dede, 2008).

7.1 Limitations

The following are some limitations of this research:

First, there is a lack of knowledge and familiarity with SNS because social networks are generally associated with young people's fun and recreation. In addition, for those teachers who were familiar with SNS, there was an expectation that the site would more closely resemble popular social networks like Facebook. It is possible that this unfamiliarity led to resistance in participation.

Secondly, much of the study depended upon my design of the site and its activities and my ability to select and use Web 2.0 tools that could enhance participation on the site. Many of the tools were new to me and I had to learn how to use them as well as develop suitable

content for the site. I also had no experience with social networking sites and had to learn to design and manage the site on a new platform, spruz.com. Site maintenance took a lot of work and as such I had to restrict the length of time of the study to four months. This suitability of the website platform itself to the study may be questioned and the facilities of the site as well as its newness may have contributed to restricting access and hence, participation.

Thirdly, there are relatively few models of good practice to draw upon and existing frameworks for examining learning on SNS are inadequate for a nebulous cyberspace. Additionally, existing theories of online learning have been configured to online courses and online social learning theories are still evolving. Links with participation to learning are at an early stage of research. I have had to glean characteristics of learning from theories of online learning, social learning and networked learning in order to explore what learning can look like on an SNS. The problems faced by the researcher are compounded by gaps in theory of online teacher learning. As such, conclusions about teacher learning on an SNS remain unsettled as the study did not provide evidence that learning took place in terms of change in knowledge, attitudes and beliefs and/or change in practices (Bakkenes et. al, 2010). I have suggested that learning took place through participation in site activities and through interactions in a shared networked environment though learning may have only taken place at knowledge levels. I have suggested a number of characteristics of learning on SNS based on my observation of participation patterns on this site based over a relatively short period of time and there was insufficient evidence that ideas expressed by teachers on the site were implemented or that knowledge shared actually altered practice.

7.2   Recommendations

There are a number of directions for future research for the role of SNS in teachers' professional learning. The popularity of SNS stems from ease with connecting with other colleagues, both locally and abroad, kinship around shared interests and opportunities to collaborate in a range of activities. Spaces designed for engagement in professional learning activities can give teachers more control of their learning as professional learning is favored to the more traditional concepts of professional development (Feiman-Nemser, 2008). Research on the site may be continued with a teacher acting as facilitator of learning and to allow for further exploration of how teachers can interact with each other and participate in activities that are designed for professional learning. Future studies can track the sharing of

site artifacts and how teachers use them in practice over time. Allowing collaboration with colleagues from other countries and cultures can enhance the site. The interest expressed by global visitors to the site should not be ignored, both for the site itself and for online course subscription.

Continued use of the site with a focus on expanding networks of teachers can lead to further exploration of teachers' learning through Web 2.0 tools to enhance their practice. There is a need for teachers to embrace these tools in the classroom to expand students' spaces for learning.

The tension between privacy and publicity can be explored further, especially as Trinidad and Tobago has such a small audience. Further, content on the site can potentially benefit both Caribbean and international neighbors. The potential of the web to make public (Lieberman and Mace, 2010) the contributions of teachers in Trinidad and Tobago cannot be ignored.

Despite the suggestions made in this study with regard to learning on SNS, there is still important work to do in conceptualizing the learning that can take place in a space that has a unique cultural context (Anderson, 2008a) and we need to exert care in defining learning in terms of participation. The measurement of participation itself is problematic with appropriateness of qualitative and quantitative measures. The idea that learning takes place by reading (Hrastinski, 2008) was accepted in this study as it allowed this role/stance to be included as participation but, this is contentious as this role was also defined as 'lurking' in other literature. Designing studies that focus on exploring shifts from individualized learning to collaborative learning are to be encouraged.

Future directions point to the expanded use of SNS and mobile technologies for informal learning for teachers and students (Selwyn, 2008) and though seductive in their appeal, still need to be evaluated for their effectiveness. These are exciting times for research, where technology can be researched as well as used for research.

7.3   Reflections on Participatory Action Research

This study suggests how participatory action research allowed me to explore teacchers' participation in an SNS. It allowed me to view *participation* in terms of the roles that people adopted on an SNS and also allowed me to look at *participatory* practices with a critical eye.

In this study, I wanted to include participants in the design and implementation of a professional development initiative that would speak to their (teachers) interests and I wanted to be on the inside of the research as well. Action research as a methodology allowed participants to be part of the research process and gave voice to those who usually have no say in traditional teacher professional development in Trinidad and Tobago. However, I encountered a number of challenges in making this action research participatory.

I found out that initial agreement to participate does not mean continued participation. At the start of the study, several of my colleagues and teachers expressed a keen interest in being part of this research and appeared excited with the idea of using a different approach to teachers' professional development. An example of this is Ms. B., an educational technologist who was instrumental in helping me to gain access to teacher participants, but who did not register on the site. This was also true for a number of Curriculum colleagues. In the latter case, even if they did register, they played minimal roles and did not provide input into the site's design or content when they had an opportunity.

I also found that while we might tend to prefer bottom-up collaborative approaches, this might not be manifested in the choices we make. While feedback from teachers about professional development programmes offered in the past by the MOE has indicated that they do not take into account teacher interests and schedules, teachers did not seem eager to share what they actually wanted. McTaggart (1991) has indicated that dialogue with participants is important for action research to be successful. Perhaps there was insufficient number of opportunities in the study for this. Or perhaps this is because of historical practices of top-down approaches to professional development. Or perhaps it is because of cultural norms that we say that which we do not mean. A number of colleagues at the MOE and teachers did not avail themselves of opportunities to collaborate or make inputs to the design of the study.

Issues of power may have influenced participation, as teachers may have felt obliged to take part in the study, due to my position in MOE Curriculum. However, where power lines were more horizontal, as in the case of my colleagues, they did not consent to participate easily.

I suggest that change takes work, both for the researcher and for participants and it may have been easier to participate in activities that did not require such effort. In this study, I tried to change my practice by changing the way I designed professional development programmes for teachers. I approached colleagues and teachers prior to design and attempted to gain feedback on the initiative during the process from both sets of participants. I tailored the

ways that participants could give feedback (see appendix 7 for 3 options) and tried to incorporate their feedback as far as possible. I also tried to decenter myself (Nicholls, 2009) as lead facilitator and allow participants to have greater control of the site's content and emerge as leaders on the site.

Allowing freedom to choose also means allowing the right not to choose. The choice of an educational social networking site was deliberate to offer teachers a fairly free space to connect and share with others and to select tools and activities of their choice. The last two chapters highlight these choices.

Exemplary participation is possible and there were many examples in this study where teachers and colleagues participated in outstanding ways. I have shown in the last chapter (see sections 6.1.1.6 and 6.1.2) how a teacher Yemi-J and a colleague Derek Haqq actively participated on the site, and provided meaningful feedback to the research process. They also both attended initial and final face-to-face discussions about the action research. I am grateful to both of them as well as other participants (see 6.1.2). In addition, I made connections with teachers in a range of curricular areas and developed collegial relationships with the active participants. Since then, we have continued to communicate and share offsite.

As I reflect on this research, I suggest that participation, as inclusion, is a moving target and can sometimes be little more than involvement (McTaggart, 1991), if participants are not willing to grasp the opportunity to gain ownership of the process. Suggested barriers for participation on the site (section 6.1.2) may also hold true for participation in the research process. And for those who did choose to participate, I have found that having congruence in goals and purposes can be difficult (Nicholls, 2009). In this study, I learnt that change is not easily achieved and that initiatives for teacher learning require effort in planning and execution.

7.4   Final Statements

In conclusion, this research has been a mixture of challenge and excitement as much of what I ventured into was unknown. My interest was to provide teachers with new and alternate models for learning as predicated on the concepts of connect!, share! and learn! These facilities were afforded by the embedding of some established and some emerging Web 2.0 tools which were new to me and to most participating teachers. There are a number of platforms that support basic services in a SNS but increased capabilities are not free. Neither

Spruz nor Ning are free for advanced services but selecting a platform that allows for desired services potentially affords participants more benefits. While interaction occurs online, and participation history can be automatically captured and used for analysis, much of the preparation and maintenance is time-consuming and supporting teachers' learning can be even more demanding than discrete school visits and workshops. I would have loved to continue to maintain relations with colleagues on the site for a much longer time and see the benefits of a team approach to site maintenance. I had hoped that my Ministry of Education colleagues would have been part of that team but it was not the case. Future research can benefit from a multi-faceted team approach to supporting and promoting teachers' informal learning on online social networking sites.

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9 Appendices

9.1 Appendix 1: Summary of profile data on some of the teacher participants who made significant contributions to the site.

Participant username	Gender	Educational district	Length of teaching service	Subject area	Position held
Yemi-j	female	St. George East	10	Social Studies	Teacher
Lowmay	male	NorthEastern	23	PE	Teacher
Dave_akal	male	Victoria	18	Math	HOD
Annoushka	female	South Eastern	8	Tech Ed/IT	Teacher
Mswight	female	St. Patrick	6	techEd/IT	teacher
Lusha	female	Caroni	2	VAPA	teacher
Angel	female	Caroni	6	Tech Ed/ Language Arts	Teacher
Allan	male	Caroni	22	VAPA	HOD
Fazeeza	female	Victoria	Not given	Tech Ed	teacher
Z Ali	female	St. Patrick	Not given	Math	teacher
Mr. Siewsarran	male	St. George East	10	Tech Ed/IT	teacher
Rosanna	female	POS	22	Math/IT	teacher
Mela	female	Caroni	9	Math/IT	teacher
Real-1	male	POS	6	Teach Ed	teacher
David	male	Caroni	11	Spanish	teacher
Antonio	male	Caroni	Not given	Vapa	teacher
Agritech	female	Victoria	Not given	techEd	teacher
stace	female	POS	25		VP
Nazrudeen	male	South Eastern	26	TechEd	teacher
pat1	female	St. Patrick	Not given	TechEd	teacher

Table 1. Profile data summary

9.2   Appendix 2:Google Analytics Participant Data Summary
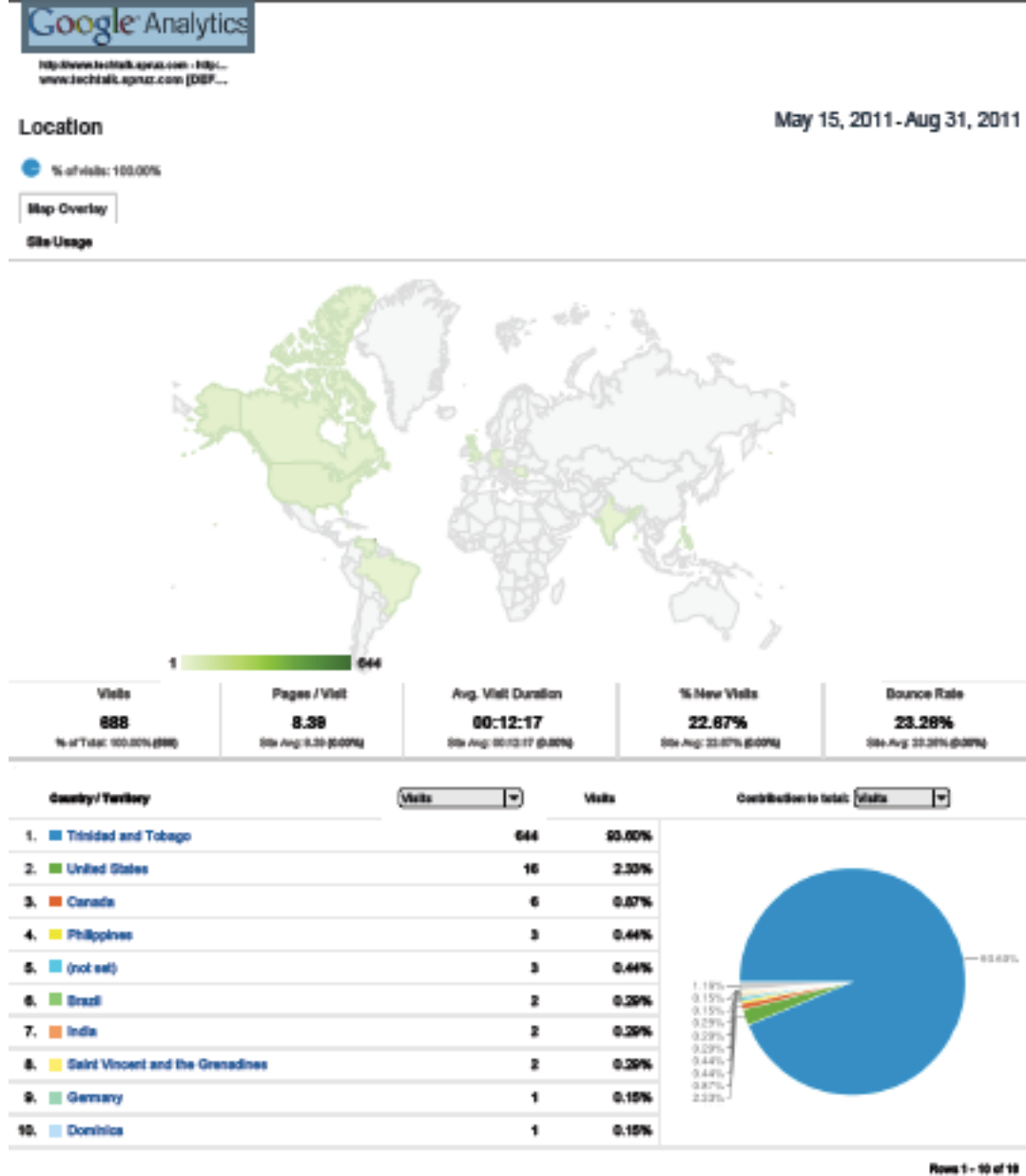
9.3   Appendix 3:Approvals from the Ministry of Education

MINISTRY OF EDUCATION
EDUCATIONAL PLANNING DIVISION
CHEPSTOW HOUSE, 56 FREDERICK STREET, PORT-OF-SPAIN
TEL/FAX: 625-0806

May 25, 2011
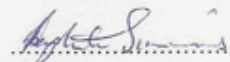
991 Western Avenue

Lange Park

Chaguanas

Dear Ms. Kamalodeen

Your request to conduct research entitled '*Exploring Teachers Participation in and Online Professional Social Network*' in schools has been approved.

Attached is a confidentiality letter which is to be signed at the Planning Division of the Ministry of Education.

Yours Respectfully,

Ms. Sharon Mangroo
Chief Education Officer
Ministry of Education

9.4   Appendix 4: Ethics Approval Letter from University of Sheffield

The University Of Sheffield.

The School Of Education.

Vimala Kamalodeen
c/o Caribbean EdD

Head of School
Professor Jackie Marsh

Department of Educational Studies
388 Glossop Road
Sheffield S10 2JA

Telephone: +44 (0114) 222 8087
Fax: +44 (0114) 279 6236
Email: t.a.earnshaw@sheffield.ac.uk

Dear Vimala

Ethical Review Application: Part II Thesis

Thank you for your application for ethical review for the above project. The reviewers have now considered this and have agreed that you can go ahead with your research project. Any conditions will be shown on the Reviewers Comments (if attached).

Yours sincerely

Tracey Earnshaw
Programme Secretary

9.5   Appendix 5:Invitation Letter to Participants

Teacher Participant Information Sheet

1.   Research Project Title:

Exploring Teachers' participation in an Online Professional Social Network

2. Invitation

You are being invited to take part in a research project. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take some time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

3. What is the project's purpose?

This research project seeks your participation in an online professional social network using an online space called Ning! where you can learn new ways to implement technology in the classroom, upload pictures and videos of yourself and your students, get expert help on technology and/or simply share your concerns about technology with other teachers like yourself from throughout Trinidad and Tobago.
This project is expected to start during the third term of this year for approximately one month and my aim is to see how you communicate and collaborate over an online space with other teachers who you may not know from before but who share common interests/concerns like yourself regarding using technology/computers in the classroom.

4. Why have I been chosen?

You have been specially chosen as you have already been using computer technology in the classroom with your students. Further you have demonstrated that you are eager to learn more about using technology in the classroom and have already tried a few things. You have working computers at your school with reliable Internet access and possibly at home as well. Other teachers from your school and other schools with similar interests are also selected to participate. Further this year the Ministry of Education has provided the first form students with laptops and expect their use to become widespread and I wish to help you to improve your skills further. It is expected that you are teaching classes from form one to form four.

5. Do I have to take part?

It is up to you to decide to participate or not. However, if you do decide to take part you will be given this information sheet to keep (and be asked to sign a consent form) and you can still withdraw at any time without it affecting any benefits that you are entitled to in any way. You do not have to give a reason. Further if you decide not to take part, simply do not return the consent form, and even if you decide to withdraw afterwards, there is no change to our relationship or difference in treatment by your principal or me.

6. What will happen to me if I take part?

You are expected to participate in this research for a period of 4-6 weeks during the third term of the current academic year. You are expected to use a computer with reliable Internet access to communicate with other participants and me. This can happen during your free periods at school - or at home if you have similar access at home. You are not required to leave school or take time off from scheduled classes to participate in this project as you can log on at your convenience. If there are times when we must engage all at once this will be agreed upon prior to the meeting, based upon your availability. Your principal and Head of Department will be aware of your participation as well.

You may also wish to show students' work and how you are using technology in the classroom with available technologies at your school. I will ask the administration, Head of department and IT technician for their cooperation for release of such equipment.

Over the course of the research you may be asked for personal information and to engage in discussions about using technology in the classroom- challenges and benefits of its use (if any). Further you may wish to share best practices, demonstrate and view students' work, collectively create and share lesson plans with technology, learn about a new piece of software or equipment, seek expert advice on lesson planning, classroom practices and work with new technologies. You may also create a personal blog which you can invite others to read/share and will be able to chat with other teachers like yourself.

You are also free to suggest what you would like to learn about and seek solutions to difficulties that you may be having in the classroom. We are here to help each other to grow and learn. But it will only happen online using forums, chats, emails, instant messaging and video conferences. The more you log on the more you can benefit.

7. What do I have to do?

All you have to do is be able to access your emails, log onto the specified site and use the tools available there. You can log on and stay as long as you like! It all depends upon your time and access to the Internet and computer, if it is being shared with other teachers. If you have your own computer this is likely to make it easier for you, but you can still participate using your school's computers. If you are using shared school equipment you are expected to follow the protocols of computer use set up by the school and supported by the Ministry of Education.

8. What are the possible disadvantages and risks of taking part?
I hope that ultimately the benefits will outweigh any possible disadvantages to being involved. However I am asking for a time commitment to the project.
However I will be structuring the project to maximize flexibility so that you can participate at times and places to suit you - the day or night, from home or at school.

The period of research is strategically set over the third term when fifth and sixth formers are engaged in external examinations.

What you choose to share with other participants is completely up to you and all participants will be expected to be respectful of one another. I anticipate we will enjoy getting to know one another, but how much information you share will be up to you; if you choose to upload photographs of yourself or your students, this data will be only for research use.

9. What are the possible benefits of taking part?

- Meeting other teachers from other schools throughout Trinidad and Tobago
- Learning about Web 2.0 tools which enable you to share, collaborate and communicate with others across time and space
- Solving day to day challenges with technology in the classroom
- Having a spot to share best practices on technology use
- Getting advice on a teaching/learning problem from Curriculum and ICT experts
- Accessing freebies like exciting video clips, education websites, localized lesson plans etc.
- Developing professional expertise and building up your CV
- Becoming more effective in using technology in the classroom without having to take a day off!

10. What happens if the research study stops earlier than expected?

If the research stops unexpectedly you would have gained from whatever participation you may have had from the start of the project.

11. What if something goes wrong?

If something goes wrong during the period of research, you can immediately let your HOD or Principal know. If the problem arises with equipment, you should contact the resident ICT technician at your school. In the unlikely event of damage or loss to the equipment such as laptop, projector, camera etc. you will have to file a report at your school and follow the usual procedures with your principal. You can contact me via email.

If there is a difficulty in the project itself you may contact the Principal and me and if you have a more serious complaint which has not been handled to your satisfaction you can contact the Supervisor of the research project Dr. Julia Davies at j.a.davies @sheffield.ac.uk or the University's 'Registrar and Secretary' at t.a.earnshaw@sheffield.ac.uk.

12. Will my taking part in this project be kept confidential?
 All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any reports or publications.

If you wish to upload audio/video recordings of yourself/ other teachers and students where faces may be identifiable, you are free to do so. These recordings will only be used for analysis and illustrative purposes for the research. *No other use will be made of them without your written permission, and no one outside the project will be allowed access to the original recordings.*

13. What type of information will be sought from me and why is the collection of this information relevant for achieving the research project's objectives?
I am seeking the texts of conversations among participants which may indicate how teachers feel about technology and teaching/learning as well as evidence/ artefacts of technology use in the

classroom as obtained from digitized texts from chats and conferences as well as audio/video clips in any form such as podcasts, digital photos etc. As administrator of the site, personal information such as age, gender, name of school, length of service and professional qualifications may also be required but not shared among participants. Participants have full control of the release of personal information on the network.

14. What will happen to the results of the research project?

Data collected will be used for analysis and illustrative purposes for the project submission. This thesis is expected to be submitted by early next year 2012.

15. Who is organizing and funding the research?

This research is being conducted by me, Curriculum officer (Math/IT) as part of the fulfillment of a Doctor of Education (EdD) degree at the University of Sheffield, United Kingdom.
I am personally funding this research.

16. Who has ethically reviewed the project?

This project has been ethically approved via 'The School of Education Ethics review' procedure of the University of Sheffield, United Kingdom.

17. Contact for further information
Further information may be obtained from:

Researcher

Vimala Judy Kamalodeen
991 Western Avenue
Lange Park
Chaguanas
Trinidad
Email: vjkamal@gmail.com
Telephone: 687-8151.

Supervisor of Project

Dr. Julia Davies
Department of Educational Studies
University of Sheffield
388 Glossop Road
Sheffield
United Kingdom S102JA
Email:j.a.davies@sheffield.ac.uk
Telephone: +44 114 222 8144

You may keep this information sheet and if you are happy to participate, please complete and sign the attached consent form. Please return to me via email or please call 6878151 for hand-collection.

Thank You for your Participation. I look forward to chatting with you!

9.6   Appendix 6: Participant Consent Form

Title of Research Project: Exploring Teachers' Participation in an Online Professional Social Network

Name of Researcher: Vimala Judy Kamalodeen

Participant Identification Number for this project: **Please tick box**

1. I confirm that I have read and understand the information sheet/email dated *[14/05/2011]* explaining the above research project and I have had the opportunity to ask questions about the project. (Email vjkamal@gmail.com for further questions). ☐

2. I understand that I am under no obligation to take part in this project and that a decision not to participate will not alter the treatment I would normally receive now or in the future . I am also free to withdraw at any time during the research. ☐

3. I understand that I am free to decline answering certain questions posed to me during the research process or to decline to engage in discussions for any reason. ☐

4. I give permission for my supervisor to have access to my anonymised responses. I understand that my name will not be linked with the research materials, will not be identified or identifiable in the report or reports that result from research. I understand that I can use an alternate id during the research process. ☐

5. I agree for the data collected from me to be used in future research ☐

6. I agree that the project may require use of text, audio and/or video which may have images of me, other teachers and students where the faces may be visible. I understand that this data will be stored safely and protected from indiscriminate use. If any images are selected later specific permissions for use may be made. ☐

7. I agree to take part in the above research project. ☐

_____   _____   _____

Name of Participant   Date   Signature

(*or legal representative*)

_____   _____   _____

Name of person taking consent   Date   Signature

(*if different from lead researcher*)

To be signed and dated in presence of the participant

_____   _____   _____

 Lead Researcher   Date   Signature

To be signed and dated and returned to participant

Copies:

Once this has been signed by all parties the participant should receive a copy of the signed and dated participant consent form, the letter/pre-written script/information sheet and any other written information provided to the participants. A copy of the signed and dated consent form should be placed in the project's main record (e.g. a site file), which must be kept in a secure location.

9.7   Appendix 7: Email invitation to Evaluate Site

From: vimala kamalodeen <vjkamal@gmail.com>
To: <trinbagoteachers>

Sent: Sunday, July 3, 2011 10:26 AM

Subject: TrinbagoTeachersUsingTechnology Evaluation Request-Urgent

http://t2.gstatic.com/images?q=tbn:ANd9GcR-IM0zyvFK-1bDrozlLEKhfqJtvhTrt7GuW
bQBdKB5V3J4ovsJzLuvXHLm

Hi Colleagues in Education

I know it is end of term and graduation is still around plus Form 1
registration and still marking papers and preparing reports and even
preparing to mark NCSE/CAPE/CSEC etc and so on.... The list is endless and
you must be tired.

Nonetheless I am making a kind but urgent request of all of you to assist me
in answering some important questions about my research project that many of
you were kind enough to participate in (Thank you).

As you are aware I am Vimala Judy Kamalodeen, Curriculum Officer, and have
launched a site called TrinbagoTeachersUsingTechnology as a pilot project to
see if this forum would allow me to communicate and support you the teachers
in your efforts to integrate technology in the classroom. The site features
a range of tools such as blogs, wikis, chatroom, page with downloadable page
with lessons, polls and surveys, games, widgets, and online PD options on
technology tools etc.

The site is now 6 weeks old and as it is the end of term(start of long
vacation), I need information from you as to where to go from here.

I would need to discuss with you about invitations, participation, tools,
the site itself, content, communications etc. I would love to hear your
views on what took place and this would help me to evaluate the success of
this idea and if/ how it can work in the future.

But I know you are busy but before you leave for the vacation I would love
you to complete this exercise, if you can, please...

Here are a few options which you can answer by just highlighting your
preferred options:

OPTION A: ONLINE SURVEYS VIA ZOOMERANG DURING THIS WEEK(Monday 4th-Friday
8th JULY)

OPTION B: LIVE ONLINE CHAT(INDIVIDUAL OR GROUP) VIA GOOGLE TALK 9PM ANYNIGHT THIS
WEEK (need to load Google talk on your computer and have fairly good
Internet access)

OPTION C: FACE-TO-FACE DISCUSSION AT AN AGREED UPON PLACE (SCHOOL OR RCLRC)

DURING THIS WEEK

OPTION D: YOUR SUGGESTION

_____

Sincerely in your service
Vimala Judy Kamalodeen
6878151

No virus found in this incoming message.
Checked by AVG - www.avg.com
Version: 9.0.901 / Virus Database: 271.1.1/3736 - Release Date: 07/03/11 02:34:00

9.8 Appendix 8:Comparison of Comments to Views

The following three tables summarize comparisons between the number of views to the number of comments in blog postings, forum postings and video uploads.

Category	Title	Date posted	Posted by	No. of views	No. of comments	Percentage of comments to views
My Lessons	Experimenting with PPT	Aug 22	Yemi_j	11	3	27%
My Lessons	My first Google docs document	Jul 21	Lusha	22	8	36%
Introductions	Information technology and me	Jul 19	Lusha	16	3	19%
Web 2.0 tools	Configure your laptop	Jul 17	Vimala	4	1	25%
Member Blogs	My students and me- why oh why do they make these mistakes?	Jun 26	Vimala	18	3	17%
My Lessons	How do you give feedback to your students?	Jun 23	Vimala	3	0	0%
My Lessons	Using ppt as an interactive learning tool	Jun 20	Yemi-J	41	7	17%
My School	TTUTA's	Jun 16	Vimala	4	0	0%

Category	Title	Date posted	Posted by	No. of views	No. of comments /replies	Percentage of comments to views
	protest actions					
My lessons	Request feedback on your lessons today	Jun 11	Vimala	5	0	0%
My Lessons	Collaborative classroom lessons	Jun 6	Vimala	20	3	15%
Member blogs	CCX CAPE Pure Math unit 2 p2 fiasco	Jun 1	Vimala	43	0	0%
Web 2.0 tools	Technology integration is not about technology	may 25	Vimala	4	0	0%
Introductions	Introductions	May 14 2011	Vimala	42	4	10%

Table 1. Comparison between number of views to number of comments in blog postings

Category	Title	Date posted	Posted by	No. of views	No. of comments /replies	Percentage of comments to views
Curriculum Mathematics	The New Interactive Math Classroom	May 21	Vimala	34	3	8%
Curriculum Spanish	Link to Spanish websites	Jul 21	Lusha	10	0	0%
Curriculum VAPA	Go Animate	Jul 23	Lusha	8	0	0%

Curriculum VAPA	Steelpan website	May 31	Vimala	3	0	0%
Curriculum VAPA	VAPA curriculum	May 27	Allan	11	0	0%
Technology-ICT	Internet Access for Form 1 students	May 19	Angel	168	8	5%
Pedagogy				0	0	0%

Table 2. Comparison of Forum views to Comments

Title	Date posted	Posted by	No. of views	No. of comments / replies	Percentage of comments to views
Powerpoint for Training and Education	May 30	Derek Haqq	58	1	2%
Music can change your mood	Jul 30	Lusha	39	0	0%
Landforms valleys Spurs	Jul 20	Yemi-J	26	0	0%

Table 3. Comparison of Video-sharing Views to Comments

9.9 Appendix 9: Survey of Participants' Views on the Site TrinbagoTeachersUsing Technology

Survey on TrinbagoTeachersUsingTechnology Site

webpage address, title, or bookmark

Exit this sur

Colleagues. Thank you for participating in the site TrinbagoTeachersUsingTechnology. I need a little feedback at this time and would be grateful for your open responses. I appreciate your time and interest. (In most cas tick all that applies).

1 Rate your experience on the site so far?

Frustrating	Satisfactory	Interesting	Exhilirating
○	○	○	○

2 What features do you like on the site?

- ☐ Discussions
- ☐ Blog
- ☐ Forums
- ☐ Training sessions
- ☐ Meeting colleagues
- ☐ Other, please specify

3 Would you invite other colleagues to join TrinbagoTeachersUsing Technology?

- ○ Yes
- ○ No
- ○ Not sure

4 If not , why not?

5 How can I improve the site to increase your participation?

- ☐ Include more lessons
- ☐ Schedule a videochat
- ☐ Email reminders/updates
- ☐ More polls
- ☐ Include games/competition
- ☐ Other, please specify

9.10 Appendix 10: Phase 3 Survey to Participants

SPECIAL INVITATION TO JOIN TRINBAGOTEACHERSUSINGTECHNOLOGY SOCIAL NETWORK SITE

1   Did you receive my invitation to join TrinbagoTeachersUsing Technology socisl network site recently?

○ Yes

○ No

2   If yes, have you taken up the invitation?

○ Yes

○ No

3   If you have not taken up the invitation, can you please you offer a reason?

☐ Don't want to join this site

☐ Didn't have the time

☐ Don't have Internet access

☐ Don't have a computer

☐ Other, please specify

[   ]

4   If you are planning to take up the invite to join, can you say when you would do this?

○ Today

○ Tomorrow

○ Next week

○ Not sure

[Done]

9.11 Appendix 11: Questionnaire for teachers who participated on the site at end of research

1. Are you registered on site?
2. From whom did you get invitation?
3. What is your impression of the site?
4. On average how many times did you visit the site?
5. What was your level of participation on the site?
6. What factors affected your level of participation on the site?
7. What factors do you think affected other teachers' participation on site?
8. Do you think the content on the site is relevant to your needs as you try to integrate technology into the classroom?
9. Which of these web 2.0 tools on the site did you feel most comfortable to use to communicate with others on the site?
10. How easy was it to navigate through the site?
11. Were you aware of free online PD courses offered on site?
12. Did the site allow you to express your views freely?
13. Do you think that the site allowed you to network with colleagues in other schools?
14. What web 2.0 tools did you use for the FIRST time on THIS site?
15. What suggestions can you give to improve my site?
16. Do you think it is possible that this site could evolve a professional community of teachers?