# An Exploratory Study of the Personal Learning Environments of Security and Investigation Professionals

Antony E. Ratcliffe, M.Ed.
PhD Student, Institute of Learning Innovation
University of Leicester
tony@ratcliffe.ca

**Abstract**

This paper describes and discusses how security management and investigation professionals use Personal Learning Environments (PLE) for work-related learning and continuing professional development. It is based on an exploratory study, using a qualitative description approach. An online questionnaire was completed by 67 study participants in 17 countries, followed by Voice over Internet Protocol (VOIP) or telephone interviews with 11 of them. The study found that these professionals participate in online discussion groups and access networks and resources. Their collaborative activities in online spaces are limited for reasons that include security, privacy, authenticity of information, and employer restriction concerns. Many therefore may limit opportunities to learn from their local, national, and international peers within PLEs. This also limits discussions of digital literacy skills that might otherwise be expected. Study participants were limited to those who responded to a request for participation posted in online discussion groups. Further research may identify those who are more actively involved in online collaboration and identify reasons for different levels of participation. Presenting case studies of successful collaborative efforts may encourage others in the occupation, enhance continuing professional development, and contribute to the research literature connecting PLEs with careers. This study contributes to the literature on PLEs and digital literacy relating to adults and work-related learning.

**Introduction**

Many occupations require qualifications or certifications prior to employment. Voluntary, or non-compulsory, certification occurs during the developing career. Employees' educational studies may be formal, but they develop knowledge through informal learning for certification or overall work-related learning. Away from classrooms, their study may be independent - often in solitude - or it may include collaborative learning with others. Modern

technologies make collaboration much easier, but employees may be missing opportunities to

enhance their collaborative informal learning through using online technologies in

occupational settings.

This paper describes and discusses how security management and investigation

professionals (security professionals) use Personal Learning Environments (PLEs) for work-

related learning and continuing professional development. Security professionals are in

management, advisory, consultant, and investigative roles with broad responsibilities for the

security and risk management of organizations. They meet face-to-face for collaboration and

learning activities, and they earn professional designations, often by self-study or with face-

to-face study groups. Some security professionals continue university education, often part-

time and at a distance. They also participate in work-related online discussion groups

(forums). The aim of this exploratory study was to gain an overview of how and the extent to

which security professionals use PLEs and what digital literacy skills they need to do so, in

advance of a broader study. The study was global because of the international nature of

business and security threats: security professionals from around the world join online groups

for informal learning.

**Related literature**

***Personal Learning Environments and Personal Learning Networks***

Online or blended (classroom and online) programs, both formal and non-formal, may

offer online platforms for resource access and discussions, known as Virtual Learning

Environments (VLEs) or Learning Management Systems (LMSs) (Wilson et al., 2006). An

alternative approach for open and informal learning is the PLE. The PLE may include a

structured VLE or LMS, but the PLE extends much further. The PLE may be described as a

concept (Attwell, 2006, 2007), considering "a PLE is comprised of all the different tools we

use in our everyday life for learning" (Attwell, 2007, p. 4). Conole, de Laat, Dillon, and

Darby (2006) studied what higher education learners are using and how. Referencing this

study, Sclater (2008) stated, "there is strong evidence that students now see the personal

computer as their primary learning tool, and this can be regarded as a de facto PLE" (p. 5). In

addition to the personal use, institutions may offer PLEs they develop to support formal

learning (Salinas, Marín, & Escandell, 2011; Sclater, 2010) and commercialization occurs

with the development for educational institutions and business organizations.

At the end of the 2006 Association of Learning Technologies conference, at

Edinburgh, United Kingdom, there was no definitive position on what the PLE was (Attwell,

2007). A review of the literature by Fiedler and Väljataga (2010) revealed that even those

espousing the PLE as a concept or approach were still treating it as a technology. More

recently, Buchem, Attwell, and Torres (2011) analyzed in excess of 100 publications through

an activity theory lens, identifying that there are "different conceptualisations of PLEs" (p. 3)

and that "the majority of publications come from Higher Education" (p. 15). It may be

difficult to separate the thinking of the PLE as an approach to learning from the visualization

of how a PLE might look. Either way, a PLE "offers a portal to the world" (Downes, 2006)

with access to people and resources. Whether the PLE is a theory or concept, or a set of

technological tools, there are places where the learners meet. According to Gee (2004), "an

affinity space is a place or set of places where people can affiliate with others based primarily

on shared activities, interests, and goals, not shared race, class, culture, ethnicity, or gender"

(p. 73). Jones and Hafner (2012) extended the term to "globalized **online affinity spaces**,

where people can meet, interact, and build relationships and communities" (p. 115).

When learners come together, in person or online, they may be building a community

of practice (Wenger, 1998). A community of practice forms with three essential elements:

domain, community, and practice (van Harmelen, 2008; Wenger, 2006). This acknowledges

that members are actively practicing in relation to a domain while working together as a

community. In contrast, an online discussion group (or meeting in person) may include those

who join but do not actively participate. Those on the periphery might not be recognized as

active members of a community, but they could be in the early stage of legitimate peripheral

participation (Lave & Wenger, 1991). According to Lave and Wenger, legitimate peripheral

participation is the process by which a new learner will join a community of practice and

develop knowledge toward "full participation in the sociocultural practices of a community"

(Lave & Wenger, 1991, p. 29). However, the mere presence of a discussion group may not

meet the criteria to be a community of practice.

The research literature covers the PLE, but there is much less written about an

associated term, Personal Learning Network (PLN) (Couros, 2010). Couros's (2010) research

relating to "the networked teacher" as a PLE (p. 124) led him to state, "My PLN definition is

simple: personal learning networks are the sum of all social capital and connections that

result in the development and facilitation of a personal learning environment" (p. 125).

Although the literature is not definitive about the relationship of the PLE to the PLN, the

view in this study is that the PLN and personal web tools are components of the PLE, as

illustrated by Wheeler (2010). Further, the current study adopts the view of the PLE as a

concept, as previously attributed to Attwell (2007), above.

### *PLE and work-based learning*

The study developed from an interest in how online communities, networks, and other

resources are used to support work-related learning and continuing professional development.

It sought to find evidence of PLEs and to identify the digital literacy skills presented in these

environments. The learning investigated was informal, considered by Hager and Halliday

(2006) as that which is not formal, taking place beyond a formal structure, unintentionally or planned. The learning could also be to supplement that of a formal learning situation offering, "specified curriculum, taught by a designated teacher, with the extent of the learning attained by individual learners being assessed and certified" (Hager & Halliday, 2006, p. 29). Further, and likely related to workplace training sessions, informal learning could support non-formal learning that is defined as "non-credentialised but still institutionally-based and structured" (Selwyn, Gorard, & Furlong, 2006, p. 7).

Younger workers are not necessarily more technologically inclined and higher users of a PLE. In one study, Attwell (2007) found that older workers made greater use of technologies. He speculated that it might be attributed to their responsibility level, access, and flexibility in their work. Attwell identified the potential uses of PLEs for continuing professional development, for sharing knowledge in organizations, and for training and development. He saw an opportunity for the PLE concept to be introduced in schools and used in relation to work and lifelong learning. Recently, researchers considered the competences of university students in two European countries and concluded that "students do not possess all needed technical, functional and social competences for self-organization, self-learning and self-cognition" (Ivanova & Chatti, 2011). This suggests that current workers and new entrants to the workforce may lack the necessary skills to establish and maintain a PLE. A discussion of digital literacy skills follows.

Adult learners participated in this research study. In andragogical theory, adults are responsible for their own learning (Knowles, Holton III, & Swanson, 2011). Researchers such as Brookfield (1984, 1986) and Candy (1991) addressed self-directed learning and the PLE may be suited to support this kind of learning, whether it be informal or formal.

*Digital Literacy and PLEs*

An extensive review of the research literature on PLEs revealed that "only a few

publications discuss what skills, abilities or competencies are necessary for developing and

using a PLE (e.g. Wild et al. 2009)" (Buchem, Attwell, & Torres, 2011, p. 14). Digital literacy

skills, or digital literacies, are the skills that may be required by security professionals in an

online environment. The research literature contains numerous related terms, sometimes used

interchangeably, including digital literacies, digital literacy, and new media literacies (Coiro,

Knobel, Lankshear, & Leu, 2008; Livingstone, Van Couvering, & Thumin, 2008). Digital

literacy skills may be considered under several frameworks. Gilster (1997) provided an early

definition of digital literacy:

> *"the ability to access networked computer resources and use them….the ability to*
>
> *understand and use information in multiple formats from a wide range of sources*
>
> *when it is presented via computers."*(Gilster, 1997, p. 1)

According to Gilster (1997), literacy means much more than just reading, and he identified

key competencies for digital literacy: "the ability to make informed judgments about what

you find on-line….critical thinking"; the ability to read and move around using hypertext and

hyperlinks; and "developing search skills" (pp. 2-3). Gilster pointed out that the Internet

provides new ways of dealing with media (p. 34).

One digital literacy framework (referred to as media literacy) is that of Jenkins,

Clinton, Purushotma, Robison, and Weigel (2006) with 11 literacies: play, performance,

stimulation, appropriation, multitasking, distributed cognition, collective intelligence,

judgment, transmedia navigation, networking, and negotiation. These were found to be too

detailed for the level of activity identified in this study. Rather, more adaptable to the study,

Jones and Hafner (2012) discussed practices that can be expected in the digital world: "online

gaming, social networking, peer production and collaboration, and practices involving digital

media in the workplace" (p. 14). They described literacies as

> *"the ability to creatively engage in particular social practices, to assume appropriate*
>
> *social identities, and to form or maintain various social relationships"*
>
> (Jones and Hafner, 2012, p. 12)

Jones and Hafner (2012) identified that learning occurs within gaming and the

associated online affinity spaces. They referred to 3-D virtual worlds, with Second Life as an

example. While not a game in the same way as video games, virtual worlds provide

opportunities for in occupational learning. Business case studies presented by Knapp and

O'Driscoll (2010) included one that may have appeal for security professionals. "Virtual

Border Service Officer Training" used Second Life in an educational setting to role-play

border crossing interviews with travelers entering Canada (Jones & Hafner, 2012, pp. 158-

173). The term 'digital' pertains to the tools being used. Social networking "has given

internet users the ability to create *the connections* between the content based on social

relationships" (Jones & Hafner, 2012, p. 144). Haffner and Jones explain that "ordinary users

of the internet" are able to make connections between people and the content that has been

created online.

### *Digital Literacy and Security Professionals*

As security professionals find or create information of interest, it can easily be shared

with others. By its nature, social networking is often open and not anonymous, allowing the

participant to be identified and establish credibility. Jones and Hafner (2012) addressed

privacy and not maintaining the anonymity that the Internet can otherwise provide. However,

as discussed later in this paper, the study reveals that there are individuals who would prefer

not to share their views openly. Not sharing may impact the attitude toward, and development

of, digital literacy practices.

The skills of collaboration and peer production extend the ability of individuals to co-

produce globally with colleagues. Through social networking technologies, the feeling of

remoteness can be reduced (Jones & Hafner, 2012). As in more traditional groups, not all will

want to participate equally, due to a lack of interest and/or skills. Jones and Hafner (2012)

described benefits and challenges of collaboration and peer production. They defined peer

production, or commons-based peer production in full, as "massive numbers of people, who

are distributed across the globe and connected to each other by digital networks, work

together voluntarily to promote projects that they are interested in" (Jones & Hafner, 2012 p.

158). An example is Wikipedia.

Digital literacies at work pertain to the digital work environment. The Jones and

Hafner (2012) framework recognized the information age, the global distribution of work,

remote workers, team work models, and the workers who work on contract or encounter

frequent job changes. Employers and employees are impacted by the needs and opportunities

to adapt that are created.

**Research Questions**

Security professionals could not be expected to know the term, PLE, found in the

research literature. It was anticipated that they could describe how they use online

communities, tools, resources, and networks for their work-related learning and continuing

professional development. It was also anticipated that digital literacy skills and practices

would be identified. Considering the PLE as a concept, the research questions were to

determine how PLEs are being established by security professionals who use online

technologies in ways that support their learning. This included the tools they use, their

networks, how they have developed skills, and whether they are actually taking advantage of

opportunities to learn within a PLE.

Personal observations and knowledge of professional development in a few different

occupations revealed that professional development programs, particularly through self-study,

do not actively support or encourage what would be seen within a PLE. It was also known

that security professionals network in person and online, but the extent of the application of

online activity to learning was open to exploration. The main research question asked was:


*How are security management and investigation professionals using personal learning*

*environments (PLEs) and digital literacies for work-related learning and, in particular, for*

*continuing professional development?*


The sub questions were:

1   What web-based tools and resources are used as part of the PLE of participants?
2   What are the digital literacy skills required to function within a PLE?
3   How have participants developed digital literacy skills?
4   Are participants contributing within a participatory culture and online affinity spaces?
5   How is continuing professional development within work-related learning settings
    being supported through the use of a PLE?


**Methodological Approach**

The exploratory study occurred from August 19, 2012, until October 19, 2012, in two

phases using an online questionnaire and online interviews. The results were to inform the

research methodology, design, and data collection methods for a subsequent larger study.

*Research Design*

The design aimed to explore the security management and investigation community, as widely as possible, to identify how security professionals use PLEs and to inform the design of the subsequent study. As a qualitative study, text responses in the questionnaire and semi-structured interview questions sought rich data. It was exploratory, so the qualitative description methodology provided "straight descriptions of phenomena" (Sandelowski, 2000, p. 339).

Requests for participation were posted to 13 online forums (or groups) frequented by security management or investigation professionals globally, 12 on LinkedIn and one on the website of a professional association. LinkedIn is a professional networking, social media site. Members of LinkedIn maintain public profiles and may participate in a wide range of discussion groups. Four of the 13 LinkedIn groups were small and later determined to be inactive.

**Online questionnaire**

An online questionnaire invited participants to participate in an interview during either the exploratory study reported here or the later study. Thirty-five participants agreed to be interviewed. Purposive sampling selected questionnaire respondents who indicated they had something to share. Small batches of interview requests followed until 10 had been completed. An eleventh participant with limited access to telephone and online communication responded to questions by email. A Canadian service hosted the online questionnaire, and a summary of the research project was posted in online discussion groups to solicit participation in this study. An information sheet and an informed consent form preceded the questions. Questions asked, mapped to the research questions, were as follows:

1. What web-based tools and resources are used as part of the Personal Learning

Environment of participants?

- Which devices do you use to access the internet?
- Are there restrictions on any of the software programs or applications you use for learning purposes that makes them inaccessible in your workplace? Please explain.
- Beyond software and applications, are there other restrictions on any of the computers or hardware devices you use that prevent you from using them in your workplace for learning purposes? Please explain.
- How often do you participate in each of these online activities, for personal, professional, or learning related purposes?
- Please describe any other online activities you do for personal, professional, or learning related purposes and/or provide any comments on the above responses.
- Which social media profiles do you maintain for personal and/or professional reasons, and what is your frequency of use?
- Please identify any 'other' from the previous question along with frequency of use.
- How do you use social media in relation to your continuing professional development?
- Do you have a network of contacts not at your office with whom you communicate for work-related learning questions or relating to your continuing professional development?
- Other than face-to-face, how do you connect with your network of contacts when you have questions relating to learning?


2. What are the digital literacy skills required to function within a Personal Learning

Environment? and 3. How have participants developed digital literacy skills?

- How comfortable are you with the following activities? (12 items identified)
- Please comment on activities that you do not do or with which you have low comfort. It would be helpful to know your reasons.
- How have you developed your computer skills to their present level?
- When I encounter a challenge with online technologies, I tend to be one who will...
- If being introduced to new online technologies or skills to assist my continuing professional development, I would prefer to experience them...


4. Are participants contributing within a participatory culture and online affinity

spaces?

- Are you involved in an online mentoring relationship?
- What are the online tools and technologies that you use for the mentoring activity?
- Do you participate in collaborative problem-solving other than working face-to-face?

- How do you use technology to participate in collaborative problem solving?
- Can you think of something you have created in an online environment for sharing with others?
- If you answered 'yes' to the previous question, what did you create?


    5. How is continuing professional development within work-related learning settings

    being supported through the use of a Personal Learning Environment?

- Can you give an example(s) of how your learning has been assisted through online technology that would not have otherwise been possible or as effective? Please describe.


*Online interviews*

        Personal interviews were conducted using Skype, a Voice Over Internet Protocol

(VOIP). Participants chose videoconference, audio, or to receive a call to their telephone.

With the participant's consent, each call was recorded by using a Skype add-on tool. A basic

thematic analysis aided by a qualitative analysis program followed interview transcription.

The following six guiding questions were asked to further investigate the research questions:

1   How would you describe your work-based learning over the past two years? How has it changed from the past?
2   I'm interested in the tools and technologies you use in relation to work-based learning, informal in particular. How have they changed, and how do you see them changing in the future years?

3   How about your social networks? Can you describe your networks and how they are used for work-based learning? How have they evolved with new technologies?

4   In our digital world, it is easy to create learning resources and share them with others. What stands out that you have seen, whether you used it or not?

5   Again, think of digital resource opportunities, what have you created that has been shared and reused by others?

6   From your perspective, what is really being done well digitally in relation to learning? What remains to be done?

The term 'work-based learning' was used during the interviews. However, 'work-related' has

appeared more appropriate. The explanation given to participants at the time of the interview

clarified the focus on learning related to work, whether at a worksite or at another location

including traveling.

### Ethical Considerations

This study was in keeping with the University of Leicester Research Ethics Code of

Practice, and the Association of Internet Researchers provides guidance for using online

research methods through an email discussion list and an ethics guide (Association of Internet

Researchers, 2012; Hooley, Marriott, & Wellens, 2012). Study participants gave informed

consent after reading an information sheet as the start of the online questionnaire. The survey

software, to support anonymity, did not collect the Internet address of the country of

questionnaire access. Participants identified themselves at the end of the questionnaire only if

they agreed to a personal interview. They could also email the researcher separately to avoid

linking a name to the questionnaire.

## Results

The exploratory study confirmed the ability to access participants, there is an interest

in the research, and there is more to learn that will inform the security management

community and academia. This section presents the data obtained during the questionnaire

and interview phases.

### Survey results

The questionnaire asked 22 questions to answer the research questions. Access to the

online questionnaire occurred 137 times from August 19, 2012, until September 7, 2012 (20

calendar days). As the first step, 103 individuals acknowledged the informed consent, of

which 67 (65%) completed the questionnaire for inclusion in the results. Thirty-five (52%) of

those who completed indicated their willingness to participate in an individual interview

during the exploratory study or main study.

Questionnaire participants represented 17 countries (Table 1).

Table 1

*Country of Residence of Questionnaire Participants*

| Country | Number | Percentage |
|---|---|---|
| Canada | 24 | 36 |
| United Kingdom | 15 | 22 |
| United States of America | 7 | 10 |
| Australia | 5 | 7 |
| Bahrain, New Zealand, South Africa (2 from each country) | 6 | 9 |
| Burma, Cambodia, China, France, Hong Kong, India, Baltic States, Mexico, Romania, Russia (1 from each country) | 10 | 15 |

*Note. Rounding error of 1%.*

All but one completing the questionnaire identified their ages (Table 2). Only one

indicated being below the age of 35 years.

Table 2

*Age Range of Questionnaire Participants*

| Age range | Number | Percentage |
| --- | --- | --- |
| 25 to 34 | 1 | 1 |
| 35 to 44 | 15 | 22 |
| 45 to 54 | 29 | 43 |
| 55 to 64 | 18 | 27 |
| 65+ | 3 | 4 |
| Not answered | 1 | 1 |

*Note. Rounding error of 2%.*

The participants were predominantly male (Table 3).

Table 3

*Gender of Questionnaire Participants*

| Gender | Number | Percentage |
| --- | --- | --- |
| Male | 60 | 90 |
| Female | 6 | 9 |
| Not answered | 1 | 1 |

**Interview results**

Ten individual interviews were conducted from October 1 to 19, 2012, and an

eleventh participant answered questions by email due to limited availability for telephone or

online conferencing. Interview participants had identified themselves in the online

questionnaire. Communications choices involved connecting on Skype with

videoconferencing, connecting with just audio, or receiving a telephone call. Four chose to

use videoconferencing, but for one a poor connection resulted in a Skype to telephone call

instead.  Six others received Skype to telephone calls. All 10 participants provided permission

to record the interviews. The 10 interviews ranged in length from 21 to 78 minutes, with

participants from Canada (60%, n=6), the UK (20%, n=2), South Africa (10%, n=1), and

Baltic States (10%, n=1). The email interview involved a USA professional.

**Data analysis**

In this exploratory study, two major themes emerged: online activities and online

challenges. The activities are what security professionals do and how they do it. The

challenges encompass what they do not do and why they do not do it. Some coding was

required to sort the data, so this was accomplished using NVivo for qualitative data analysis.

The coding was kept broad to avoid "premature coding and sorting [which] are serious threats

to analysis when researchers abdicate their full responsibility" (Thorne, 2008, p. 144).

*Online activities*

Most participants responded to researcher requests in LinkedIn discussion group

messages. While 67% read discussion messages regularly, only 13% responded to messages

regularly. The other choices were 'infrequently,' 'tried it but stopped,' or 'never.'

Questionnaire participants responded about their involvement with specific online activities.

The percentage represents those who do the activity regularly:

- Starting discussion topics by linking to an article, story, etc. (15%)
- Writing blog posts (7%)
- Posting updates on Twitter, Facebook, or other social media (29%)
- Gaming such as World of Warcraft (3%)
- Activities in a virtual world, such as Second Life (1%)

Participants completing the questionnaire identified other online activities with which they

are involved:

- Email
- Work related research
- Course work including research, online study portals, podcasts, course discussion boards
- Online training programs for software and products
- Skype for overseas contacts
- Webinars, webcasts, and podcasts
- Virtual conferences
- YouTube for research including conferences and speakers
- Educational programming from Khan Academy and iTunesU
- News from local, national, and international sources
- Reading
- Restricted professional discussion groups or sites
- Internet communities, including Reddit.com
- Language learning
- Completing professional certifications
- Mentoring
- Solving client problems beyond own experience
- Sharing organization knowledge with the public
- Maintaining currency in relation to industry trends
- Relationships with learners when teaching within online course platform
- Finding hard copy text books to order, preferring over e-books

Interview participants added the following online activities:

- Presentations from BrightTALK and TED Talks
- Global communication
- Making learning continuous, even after the course ends
- Accessing the opinions of many people, from different sides of an issue
- Course learning from anywhere
- Email distribution lists, as frequent as several times daily
- Using videos from YouTube when teaching a subject area in which instructor does not have expertise
- Text alerts of major happenings before the news

The questionnaire and interviews explored what participants had created and shared.

Responses included preparing materials for courses and workshops and sharing them online.

Participants mentioned developing websites (for internal use by their organization and for

public consumption), databases, and a Wiki (an online document that can be edited by

others). Some wrote papers, articles, and blog posts.

Participation on LinkedIn was the most prominent online activity to consume

information and connect with industry colleagues. Email (97%) and telephone (81%) are the

most prominent methods of contact with colleagues and others. The preference for email

allows messages to be selectively and easily sent to a large number. Privacy of the

communication was a concern. Sending by email avoids others knowing about the nature of

the enquiry when not appropriate, rather than asking within discussions groups. One security

manager commented on networks for learning:


*"Professional network sites like LinkedIn provide great opportunities for learning whether*

*through posting links to articles, requesting assistance with research, or generating*

*discussions.  It makes it much easier to get a variety of perspectives and find out the*

*differences and similarities in performing security work in different industries as well as*

*different countries.  Technology has evolved to the point where we can carry on real-time*

*conversations with professionals in other time zones and can get immediate assistance as*

*situations unfold instead of having to wait for "normal business hours" and adjust for*

*time differences.  Security never operates solely on normal business hours."*

 Security manager, USA

### *Online challenges*

The second theme was the challenges of online activities. This section covers security

professionals' decisions to avoid or minimize activities. It also includes restrictions placed

upon security professionals in the workplace. A small number saw no need for online

activities. Their comments included satisfaction with current methods, no need for online

activities to develop a network, and no need for immediate information feeds. Online

activities were a waste of time for some due to being of limited value and because of the

amount of 'noise' created. One participant made the following comment and highlighted the

fear of employer criticism:

*"I find that the forums are generally limited to people who are out of work and consultants*

*who only speak for themselves, and people from large organizations don't necessarily*

*participate because they don't feel that they are only speaking for themself, they don't want*

*to be accountable for the things they are saying in those forums. But other than that, I*

*really enjoy them, and for that reason I don't participate. I don't need my human resource*

*department calling me about something I put online."*

 Security manager, Canada

Having limited time was a reason for reduced online activities. One participant stated that it

was important for something to catch his attention and motivate immediate action. Another

was attracted to activities that involved connecting with someone in a "leadership role." One

participant expressed a lack of knowledge of what is available online, being only aware of

webinars. Other comments included:

- "'entertainment' social media…a waste of time"
- "I don't tweet, I think it's idiotic frankly."
- "I dislike social media."
- "I think blogs are a waste of time: reading about some idiot and what he had for breakfast: nobody cares."
- "I don't care about somebody's personal opinion on something. Like to me it ranks up there with blogging as a complete waste of time."
- "Pre-recorded content webinars, I think are disastrous."

One participant observed: "Formal society groupings (corporations, governments,

universities) have not fully grasped the big change in distributive, collaborative learning and

how that will affect people in everyday real world." Another participant mentioned that social

media are banned at work for productivity-related reasons. Another participant said that

excessive personal use would result in a discussion with the employee about the use.

Employer or other workplace restrictions were numerous. They included the following:

- rules against non-business use
- prohibitions against downloads or the use of external and devices
- emergency only use of the internet on mobile devices
- restrictions to some websites and applications
- special permissions required
- personal devices not allowed
- firewalls, outdated technologies, and compatibility issues not allowing access
- equipment such as a webcam not provided

Some participant and employer concerns related to security and sensitive activities.

Concern about computer hacking and espionage encouraged the use of internal resources and

prohibited USB devices in one company. Another participant spoke of vulnerability if able to

access computers and turn on the camera remotely. There is concern about data remaining in

existence and who might have unintended access to it. Identity theft is feared. Authenticity is

also a concern. Before relying on information found on the Internet, participants wanted to

validate the source. This was not always easy to do. A concern related to someone publishing

online using the identity of another. One participant suggested that a reputable organization

should verify the credibility of what might be course offerings. Another participant was

confident with his personal ability to identify suspicious material but added he could not be

certain. These challenges appear to be beyond those strictly related to learning, but they may

impact opportunities to access online communities, resources, and networks.

**Discussion**

The main research question asked, "How are security management and investigation professionals using PLEs and digital literacies for work-related learning and, in particular, for continuing professional development?" This question presumed that research study participants used PLEs and would demonstrate digital literacy skills, particularly since they were primarily recruited online. The research study questionnaire and individual interviews revealed a limited range of online learning activities, but the data provided a start at understanding why such activities might be limited or focused in online discussion groups.

Sub question 1 asked, "What web-based tools and resources are used as part of the PLE of participants?" There were no surprises; they use computers and mobile devices for Internet access, email, and telephone calls. Sub question 2 was, "What are the digital literacy skills required to function within a PLE?" The research literature answers this and provides skill frameworks. The study yielded limited finding of such skills, as participant activities were often limited to reading rather than identifying examples of activities such as peer production, collaboration, and gaming.

Sub question 3 enquired, "How have participants developed digital literacy skills?" They identified that they developed their skills attending courses, getting help from friends, family, and work colleagues, searching the World Wide Web, reading, exploring, and experimenting. There appears to be no lack of ability with the presence of willingness and support. Confidence was present: participants felt able to learn whatever was required in the ability to learn whatever is required for operating proprietary systems and following protocols. There was very little interest in gaming and virtual worlds, though one participant raised them as essential for teaching certain skills.

Sub question 4 was, "Are participants contributing within a participatory culture and online affinity spaces?" They appear to be online, but for many the level of activity is low. While SMIPs read and respond to discussion messages, and they might start discussions, many contribute infrequently. They are more likely to be consumers of information rather than producers or co-producers. Two participants expressed a preference for seeing the work of organizations and 'thought leaders' with noted expertise.

Sub question 5 asked, "How is continuing professional development within work-related learning settings being supported through the use of a PLE?" Discussion groups and various online resources were sought when information needs arose. Some SMIPs did contribute resources for others, but a primary activity was consuming the available information. This suggests a different approach may be needed in the main study to identify possible examples of those creating and sharing content.

Prominent themes were security, privacy, and authenticity concerns in addition to not seeing a need for online activities, having a lack of interest, and having no time. These concerns are personal for many, but employers often have equipment, software, and access restrictions. Security threats are an ongoing concern. Daly (2013) explained that the very act of sharing socially is what can expose an individual to threat, such as providing personal information that could be used to create a security breach. These threats can indirectly result in a minimized use of online resources if the general use of computers and other devices is curtailed.

Despite the factors described that limited the activities, 67 participants provided data relating to their online activities. Online communities, tools, networks, and other resources are used for purposes of work-related learning and continuing professional development. A high use of the telephone and email may represent collaboration occurring in non-public

spaces with 2 or more participants; however, the reported use of discussion groups

demonstrates a lot of reading of the news and information posted by others.

**Conclusion**

This was an exploratory study of how security professionals are using their PLEs and

digital literacy skills for work-related learning and continuing professional development. It

was global and involved a total of 67 study participants from 17 countries. All completed an

online questionnaire, and 10 participated in individual interviews, online or by telephone. An

eleventh study participant provided input by email.

In the questionnaire, study participants provided information that included devices

they use, their technological skills, online activities, networks, collaboration, and learning.

Those interviewed were asked more about their learning, tools and technologies, social

networks, learning resources, and digital literacy practices. The participants, as security

professionals, clearly accessed discussion groups and other resources for information to keep

up in the industry or to answer questions that arise. Some create information for others,

including linking to news stories and the blog post of themselves and others. Collaboration

also takes place in private settings with the more traditional technologies of telephone and

email. Some participants expressed their reluctance and caution when sharing in online

spaces. More study participants could be seen to be consumers and users of information

rather than creators. The data did not provide a lot of examples of security professionals

contributing within the participatory environment. This might be attributed to many security

professionals being in the early stage of legitimate peripheral participation, which may lead to

greater participation as knowledge and comfort increases. At that time, examples of digital

literacy practices may be more evident. This may provide examples to encourage other

professionals to participate in the sharing of their knowledge while learning from others.

**Future research**

A subsequent and larger study (in progress) commenced with observations in online

communities, followed by interviews with security professionals to more closely examine

how online communities are used for work-related learning and professional development.

Security professionals often work within environments with practices influenced by global

events. The need to share and collaborate for work-related learning and continuing

professional development is not expected to lessen. Observations, discussion, and

interpretation may lead to a better understanding of their online communities and uses of

networks and resources in the security management and investigation fields. There is much to

be understood in this area of research, particularly beyond higher education settings and

related to the workplace.

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