An investigation into secondary school teachers' understanding, perception and practice of information literacy and continuous professional development

Emma-Louise Lamont

Abstract

The aim of this research was to gain an insight into how Scottish secondary teachers' conduct their CPD and to explore their understanding of and engagement with information literacy, and whether they continue to develop their information literacy through their CPD. To consider if teachers have the need for further support in developing their information literacy and whether they have cultivated skills in information literacy through prior experiences in education and work.

A qualitative methods approach was selected as being most viable for collecting data which deals with perspectives and complex ideas. Using semi-constructed interviews, it allowed teachers to share their individual experiences and stories. Vignettes were also used, to allow teachers to provide their own understanding of information literacy and to demonstrate components of information literacy which they would teach. The term information literacy was not expected to be a term familiar to teachers, as prior research had already discovered, so the use of vignettes provided better insight without having to rely on using terminology which may cause confusion for participants. To provide a context to teachers' understanding of information literacy, a textual analysis was carried out on the Scottish curriculum.

The results of the interviews, responses to the vignettes and textual analysis result were analysed and discussed in the context of the literature review. The investigation found that although teachers were unfamiliar with information literacy, they understood the fundamental skills associated with it and recognised its significance for education and for general life skills. They were confident in their own information literacy abilities but considered there to be no professional development support available to them. They also did not recognise some of their informal CPD practices to develop their information literacy.

Keywords
Teachers, secondary schools, information literacy, continuous professional development

1. Introduction and background

Information literacy has been described by Bruce as the 'overarching literacy of life in the 21st century' (cited in Martzoukou and Sayyad 2017 p.634). It has also become a global concern within education and is considered an essential component for the creation of successful individuals equipped for 21st-century life (Kereluik et al. 2013). The digital advancement of the internet has resulted in an abundance of information being accessible, from numerous sources resulting in the phenomenon of information overload (Bawden and Robinson 2009). With vast amounts of information easily accessible, the ability to search, assess and manage information has become a valuable life and work skill (Kereluik et al. 2013). However, research conducted by Rockman (2002) has unveiled concerns over digital-aged citizens lack of information skills, which has proven to be a widespread concern (Kirschner, Sweller and Clark 2006).

Crouse and Kasbohm (2005) also reported that teachers lamented the poor quality of research papers produced by pupils, as they did not demonstrate well-developed information literacy skills. Therefore, the interest in information literacy and education is ongoing, as it is considered an essential skill for modern living, work and education.

Information literacy is an essential component of education, and to be able to teach this successfully, teachers must be confident in their own information capabilities, as their ability to model these skills will be essential for instilling information literacy skills and attributes in their pupils (Duke and Ward 2009). However, it has been evidenced through prior research that often teachers are not fully aware of what information literacy is and struggle to define or explain it (Probert 2009; Crouse and Kasbohm 2005; Davis-Khal and Payne 2003). Research has also explored how information literacy can be taught as part of a teacher training curriculum to further develop teachers' skills in this area, which suggests that further guidance beyond undergraduate degrees may be required for teachers (Geldenhuys and Oosthuizen 2015; Klebansky and Fraser 2013; Johnson and O'English 2003). Training teachers to use their own information literacy abilities and skills for when they enter the classroom, to help develop their pupils' information literacy levels (Crouse and Kasbohm 2005). Further research in how practising teachers have and continue to develop their information literacy needs to be conducted, to highlight whether they have the opportunity to develop these essential skills beyond their teacher training.

It is imperative for this piece of research to relate information literacy to the aims and objectives of education within Scotland so that it can be fully understood within this context. The Scottish Curriculum for Excellence has four capacities which are the overarching aims for the curriculum. They aim to create successful learners, confident individuals, responsible citizens and effective contributors (Scottish Executive 2006). These four capacities align with definitions of information literacy and can be achieved through the development of information literacy. For example, successful learners and confident individuals, are pupils who can conduct research and apply knowledge in different contexts. Hence learning information literacy skills and using these skills in different areas of their learning and lives will assist in achieving these educational aims. Research has evidence that information literacy, when taught in context, can help produce confident, information literate individuals who can apply these skills to other contexts (Probert 2009). Duke and Ward (2009) argue that teachers who demonstrate information literacy in their classrooms produce pupils who are prepared for a lifetime of learning. This argument supports the connection between information literacy and successful learners, being created by teachers who are confident in their own abilities.

Other links between information literacy and the capacities of effective contributors and responsible citizens have been established through the ethical considerations of sourcing information and giving credit to other people's ideas and work (Kereluik and Mishra 2013). Armstrong et al. (2005) describe information literate people as being 'responsible, culturally sensitive and ethical' with information (p.6). Duke and Ward claim that information literacy prepares pupils to 'actively participate in the democratic process' and empowers them to 'participate in the social, political, and economic decision-making processes that impact their lives and communities' (2009 p.252). Within the definition of information literacy given by CILIP (2018), it is considered 'an important contributor to democratic, inclusive, participatory societies' (p.3). These are important values which transcend information literacy to other contexts beyond education, into practical life skills, which enable people to fully participate within society.

Information literacy has been researched in various contexts beyond that of education, including the workplace, such as research into firefighters by Lloyd, and Cheuk's research on knowledge workers (Inskip and Donaldson 2019). An argument for researching information literacy in different work contexts, presented by Abdi and Bruce, states that because each workplace is unique, information literacy will be conducted in different ways and have a unique meaning in these different workplaces

(2015). Lloyd's case studies examine information literacy in different contexts, mainly work environments (2005; 2008). It is argued by Lloyd that librarians' concept of information literacy, limits its understanding to only an educational setting, rather than relating it to all aspects of life and in wider contexts (2005). Engaging with information literacy in different 'contexts, concepts and truths will result in 'learning practices which are transformative, generic and transferable' (Lloyd 2005 p.82). Abdi and Bruce conducted their study in information literacy in the contexts of educational, workplace and community (2015). Exploring information literacy through the context of teachers' individual backgrounds and continuing professional development (CPD) will add to this area of research.

Lloyd's definition of an information literate person is someone that is 'engaged, enabled, enriched and embodied by social, procedural and physical information that constitutes an information universe' (2004 p.84). This definition can be applied to different contexts whilst considering how personal concepts of information literacy are formed. Due to the diversity in educational and work backgrounds of secondary teachers, the workplace context is complex. Wegner describes the learning process as being located, 'not in the head or outside it, but in the relationship between the person and the world' (2010 p.1). Learning is a process which is inseparable from an individual's context, which is also true of information literacy being related to an individual's prior life experiences – through education and work. Research has been conducted on student teachers which explored the diversity in their backgrounds alongside other elements, and how this impacted on their information literacy capabilities (Crouse and Kasbohm 2005; Klebansky and Fraser 2013). However, research into practising teachers' backgrounds affecting their information literacy capabilities has not been conducted. Teachers' prior experiences, such as educational and work background will impact upon how they develop their information literacy competencies, alongside the professional development they are undertaking. The relational approach to understanding information literacy focuses on the relationship between people and information. This is done by investigating the perspective of people who are experiencing information literacy (Andretta 2012).

Less research has been conducted on how teachers can develop their information literacy capabilities once they are qualified. By exploring teachers' continuing professional development (CPD) in relation to information literacy, teachers' individual experiences of developing their information literacy abilities can be examined. Further research into this area is still needed, to ensure that teachers are supported in developing information literacy, as they construct the learning environment for pupils and will be able to model these skills in the classroom. The rationale for this research is formed on research which indicates the importance of information literacy as a lifelong learning skill which sits within the Curriculum for Excellence's four capacities. For teachers to effectively develop their pupil's information abilities, it is important to examine the teacher's own viewpoint on information literacy and explore how their information literacy has been developed and supported.

1.1 Aims
The aim of this research is to investigate teachers' understanding and perception of information literacy and to explore how they develop their information literacy through their continuing professional development (CPD) and based on their prior experiences through their educational and work backgrounds. For this research, no specific area of information literacy was predetermined, as the purpose was to explore teachers' understanding and perception and how information literacy was represented in the curriculum for excellence.

1.2 Objectives
To achieve these aims, the following objectives will be followed:

1. Explore secondary teachers' understanding of information literacy and what they perceive are important elements.

2. Analysis of information literacy within the Curriculum for Excellence.
3. Discover how teachers have developed their information literacy abilities based on their educational background, personal development as lifelong learners and CPD they undertake.
4. Explore what methods of CPD teachers are engaging with and how they relate to information literacy development.

1.3 Terminology

Throughout this dissertation the following abbreviations will be used; continuing professional development will be known as CPD. Secondary school teachers will be referred to as teachers, with any references to teachers who work in primary or higher education being given their full job title. Deputy Head Teachers will be referred to by the abbreviation DHT.

2. Literature review

2.1 Defining information literacy

The term information literacy was first coined in 1974 by Paul Zurkowski and has since undergone various attempts to provide a definitive definition (Alvarez 2015). Information literacy is a complex term which has evolved over time, with initial definitions providing a list of skills, competencies and characteristics which regarded information literacy in relation to education and as something which could be measured and assessed. Such as the definition given by the American Library Association:

> Knowing when they have a need for information, identifying information needed to address a given problem or issue, finding needed information, evaluating the information, organizing the information, and using the information effectively (Breivik 1998 p.7).

The understanding of information literacy has moved beyond a list of skills and is more recently considered a social practice (Lloyd 2013 abstract). Lloyd considers information literacy through a sociocultural perspective, as a 'community in shaping the production, reproduction and circulation of knowledge' (Lloyd 2011 abstract).

The definition used in this research was selected for its relevance to this study and follows the argument that information literacy depends on its context and the individual's experiences. However, due to teachers not being well aware of the terminology, they would be more comfortable with a definition which lists skills needed for developing information literacy – as this connects with how information literacy is presented within the curriculum which they teach. For this reason, the definition from CILIP (2018) was selected, as it is comprehensive in explaining information literacy for those unfamiliar with the terminology but develops it further than a list of skills and abilities and provides examples of different contexts.

The most recent definition from CILIP describes information literacy as being the:

> …ability to think critically and make balanced judgements about any information that we find and use. It empowers us as citizens to reach and express informed views and engage fully with society. Information literacy incorporates a set of skills and abilities which everyone needs to undertake information-related tasks; for instance, how to discover, access, interpret, analyse, manage, create, communicate, store and share information. (2018 p.3.)

Which succinctly describes the breadth and depth of information literacy and its importance in all areas of life. All forms of information are relevant to information literacy; including verbal communication, visually represented information, print and digital content (CILIP 2018). The necessity for creating information literate people is that it is considered a human right by UNESCO and is a crucial component of lifelong learning and societies development (CILIP 2018). CILIP further explains

information literacy in relation to different contexts, which are; everyday life, areas relating to citizenship, education, the workplace and in relation to health (2018). Using different contexts to describe information literacy reveals the complexity of providing a set definition. The use of contexts to explore information literacy has been conducted in various pieces of research by Lloyd, who has overseen case studies in specific work environments and views information literacy as being related to its context (2008; 2010; 2011; 2013). Contexts in Lloyd's research refers to work contexts, but also to the context of social communities (2011). Arguably work contexts and social communities can be difficult to differentiate between, depending on the relationships of research participants and workplace dynamics.

The development of information literacy has also seen it become intrinsically linked to skills in technology, as frequently it is through technical devices that information is sought, read, processed and distributed (Bruce 2004). This creates a danger in only considering information literacy in regard to ICT and digital literacy which narrows the importance and complexity of information literacy. Brevik argues that information literacy encompasses all other literacies which are often associated with it – such as computer literacy (1998 p23). It is essential that information literacy is considered more broadly, than digital skills, as not all resources require digital access and they are as relevant.

Information Literacy encompasses the skills and abilities required for seeking, understanding and using information, but to understand the term fully, the context must be considered, as well as ethical considerations of the use of information and how it all connects to the personal development of knowledge and understanding.

2.2 Information literacy in a secondary school context

Workplace and Academic information literacy are very different, indicating that context plays an important role in, due to different motivations and purposes for obtaining and using information (Inskip and Donaldson 2018). Abdi and Bruce (2015) explain the reasoning being that people are not limited by workspace and will interact with people beyond this and use other resources which reach across the whole profession. This can be applied to teachers, as they take part in school cluster meetings and CPD events involving professionals from other schools, and therefore must be considered in a broader context than their immediate workplace.

An aspect of information literacy which is poignant to the context of secondary schools is cross-disciplinary knowledge, as teachers must be able to synthesise information from one context and apply it to another (Kereluik and Mishra 2013). An example from one of the schools' which participants taught at, is that several of the social subject teachers were also given the role of literacy teacher. They were able to apply their knowledge of information research, evaluation and analysis to teaching a different area of the curriculum. However, Shenton and Fitzgibbons (2010) warn of the time and effort teachers must exert when teaching a topic that is not within their area of expertise. This can occur when teachers provide cover for other subject areas and teach a lesson which contains information they are not familiar with. Teachers cross-disciplinary knowledge and information literacy skills are beneficial for facing these challenges.

2.3 Teachers' perception and understanding of information literacy

A key piece of research into teachers understanding of information literacy was carried out in New Zealand By Probert (2009). Her results indicated that although teachers had some understanding of information literacy, they tended to define it through literacy and reading, or through information and ICT (Probert 2009). Similarly, Smith's interviews of eight teachers in 2013 found that teachers were unaware of the term information literacy and gave varied and inconsistent explanations of the term. This implies that teachers have a partial understanding of information literacy and have not received professional guidance on this term.

Linked to teachers' understanding of information literacy, is their ability to demonstrate their capabilities. Research by Alvarez (2015) on Spanish secondary school teachers indicated that teachers had a high self-perception of information literacy and were successful in locating information. However, they demonstrated poorer skills in evaluating information and did not practice this aspect of information literacy as keenly as others (Alvarez 2015). Williams and Coles (2003) research on teachers' attitudes and skills in relation to how they conduct research, found that teachers had problems with seeking and evaluating information. The teachers who participated in Williams and Coles research, demonstrated less concern about sources validity, level of bias and credibility through supporting evidence (2003). These studies on teachers' information literacy skills and abilities indicate specific areas which need further developed and supported.

2.4 Teachers' CPD

Teachers are now faced with the challenge of possessing and teaching twenty-first-century skills which are required for the changes in society. Research from Bennett and Anderson indicates that teachers being able to adapt and willing to learn, are essential for schools thriving during challenging times (cited in Geldenhuys and Oosthuizen 2015). Therefore, teachers should be active lifelong learners, who are adapting to the changes within education and in greater society. CPD has become an important focus of school reform initiatives, due to research which has indicated that the quality of teaching depends on teachers' motivation and willingness to engage with training and development (Gorozidis and Papaioannou 2014; Geldenhuys and Ooshuizen 2015). Findings from Henri, and also from Cass have concluded that teachers' information literacy skills need professional development (Probert 2009). However, Lloyd (2005) provides the view that information literacy is developed holistically, through collective learning. This suggests that informal CPD can benefit information literacy development and that it does not necessarily need to be formally taught to teachers.

The definition of CPD used which has been used within this research and given to participants during their interviews comes from ATL the education union (2015), who consider CPD to consist of all activities, formal or informal, that helps teachers develop their skills and knowledge, and enhances their professional practice (p.1). CPD undertook by teachers, according to Day consists of 'all natural learning experiences' as well as planned activities which will enhance the quality of teaching and learning in the classroom (cited in Hustler and McNamara 2003 p.24). Such activities include; mentoring, school improvement planning, attending school cluster meetings, peer observations, studying, reflecting on lessons and group work (Geldenhiys, Oosthuizen 2015; Gulston 2010). According to research from Caena, effective CPD should consist of; a basis in research with a strong knowledge base, involve active learning, include feedback, have a specific focus, assist teachers in developing the skills required to teach specific content (2011).

CPD can be considered as being formal or informal. Formal CPD referring to organised learning activities such as school cluster meetings, school improvement planning and workshops. Some researchers consider there to be limitations to formal, organised CPD events such as workshops. Barber warns of the dangers of narrow-minded views of inset days which aligns with the argument that for CPD to be effective, it should be teacher-centred and teacher-led (cited in Hustler 2003). Geldenhuys and Oosthuizen's research emphasise the importance of teachers' involvement in the planning, implementation and evaluation of CPD programmes which are offered, in order for CPD to be beneficial (2015). Informal CPD refers to reflective learning, personal research and study and any unorganised learning opportunity. Some research found that teachers' informal learning activities included, collaboration, reflection, researching information from sources and experimenting (Kyndt, Gijbels and et.als 2016). However, formal and informal CPD is a scale rather than a strict categorisation (Kyndt and Gijbels et al. 2016). Campana found that teachers tend to spend several hours a week undertaking informal CPD, in the form of learning conversations with colleagues (cited in Macia and

Garcia 2016). According to Tafael and Fischer, what teachers seek from CPD, is the opportunity to reflect on their teaching and to discuss and learn with their fellow teachers (2001).

Effective CPD occurs when teachers 'are encouraged to take risks, try new strategies in the classroom, and to report back and share with colleagues' (Tafale and Fischer cited in Davis-Kahl 2003 p.313). This approach suggests that action, reflection and collaboration results in effective CPD. Attending workshops and events are only beneficial when further action is taken by teachers. Research on teachers' CPD highlights the limitations of teachers' professional development being an individual process, and of the involvement of experts providing workshops (Burbank and Kauchak 2003). When teachers are put into a passive role, their professional development is limited, collaborative approaches where ideas are generated are considered more effective (Burbank and Kauchak 2003).

Collaboration and reflection are key themes which have emerged from several pieces of research. Reflection is a key component of CPD and to support this type of analysis on teachers' practice, alternative forms of inquiry such as journals, peer observation and interviews would reveal areas which need further developed or supported (Cochran-Smith and Lytle 1993; Gitlin, Barlow and Burbank 1999). Collaboration between teachers has also been found to be an important factor in pupils' achievement according to Moolenaar and Yoon (cited in Macia and Garcia 2016). CPD should consist of a mixture of informal and formal practices.

2.5 Information literacy and lifelong learning

UNESCO's definition of information literacy claims that it is a prerequisite for participating effectively in the Information Society and is part of the basic human right of lifelong learning (CILIP 2018). This terminology emphasises information literacy as being a component of lifelong learning, which arguably is part of all contexts in life and not confined to formal education. However, Armstrong and Boden (2005) argue that although being reflective, and a lifelong learner, greatly supports information literacy, it is not an actual component of it. They claim that it is not possible to develop information literacy if you are not a lifelong learner (Armstrong, Boden et al. 2005) Despite the differences in opinion on whether lifelong learning is a component of information literacy or not, they believe that there is a connection between the two is shared by others.

Breivik's model of information literacy provided early mentions of lifelong learning in connection to information literacy (cited in Marcum 2002). This model demonstrated that information literacy helps create active, independent learners (Breivik 1998). Bruce also made connections between lifelong learning and information literacy, claiming that information literacy skills and capabilities underpin the 'higher-order cognitive and meta-cognitive skills like critical and creative thinking, problem solving, informed decision making, communication and independent self-directed learning' (cited in Klebansky and Fraser 2013 p.105). Bloom's revised taxonomy provides a classification of higher-order thinking skills which are important for learning and have been referred to as 'tools for thinking' (Forehand 2010 p.51). This tool for thinking can also be used to assist teachers in creating lessons which will require pupils to function at more complex, higher-order levels of thinking (Forehand 2010 p.52).

Continuous lifelong learning is connected to information literacy, according to Bundy, as information literacy provides the construct for 'learning how to learn' which facilitates deep rather than surface learning (Klebansky and Fraser 2013 p.105). Higher order thinking, lifelong learning and information literacy are all connected and support each other. The American Library Association (ALA) issued a report in 1989 which claimed that it was essential for teachers to be information literate so that they can prepare students for 'a lifetime of learning' (Duke and Ward 2009 p.247).

Wurman describes the significance of information literacy education as lying in 'its potential to encourage deep, rather than surface learning, and in its potential to transform dependent learners into independent, self-directed, lifelong learners' (Probert 2009 p.5). This concept of information literacy, as being connected to lifelong learning and deeper learning links to teachers' CPD. Teachers embark on lifelong learning when they enter their profession and are continually updating their practice and developing their knowledge due to the continually and rapidly evolving educational climate (Caena 2011). EU research on teachers' CPD shows the connection between a teacher's commitment to continual learning and pupils' education (Caena 2011). It is further argued that to achieve this objective, teachers must develop their own high-order thinking skills and must receive effective opportunities for CPD (Caena 2011).

It has been demonstrated that there is a connection between information literacy and teachers' CPD, through the concept of lifelong learning. Both terms share overlapping themes in relation to higher order thinking skills and lifelong learning. Barber argues that professional development should be founded on 'the idea of the teacher as a lifelong learner who is a member of a research-based profession' (cited in Hustler, McNamara, et. Al 2003).

2.6 Value of the proposed research
The importance of instilling strong information literacy capabilities in pupils has been well established, and research has indicated that teachers present a prime opportunity for pupils to develop their information literacy skills (Smith 2013). Therefore, exploring teachers' own concepts and understanding of information literacy is essential. Teachers' information literacy is an area which has been well researched however, the connection between their professional development and how they continue to develop their information literacy, has not been as extensively investigated. Williams and Wavell claim that teachers have unique teaching experiences based on their prior professional, personal and academic backgrounds (2006). Similarly, this research is based on the concept that teachers' experiences of information literacy and perception of it will be moulded partially by their prior experiences – from their educational and work backgrounds, as well as their current experiences of professional development. This investigation aims to explore through the concept of individual context and workplace context, to add to the research already conducted on workplace information literacy.

3. Methodology
Qualitative research through the form of semi-structured interviews with teachers was the primary method used for gathering data, due to the nature of the research being explorative in its attempt to gather teachers' unique understanding of information literacy within secondary education and examples of teachers' perspectives and practises of CPD, looking for connections between the two. The interviews were closed with vignettes, which provided insight into which aspects of information literacy participants believed as important to teach to their pupils. To provide a context to the teachers' responses about information literacy during the interviews, a textual analysis was conducted on key documents from Education Scotland to discover which elements of information literacy the teachers were expected to teach.

3.1 Research design
The use of semi-structured interviews and vignettes was decided, as they would produce more authentic and individual, personal results than the use of a survey. Although the use of a survey would have resulted in a greater collection of data, the quality of this data would vary depending on the length of time and effort participants put into completing it. During a semi-structured interview, participants can be probed to talk further on an answer, or the conversation can move in an interesting

and unexpected way. The answers given are not pre-prepared and it allows for genuine opinions to be shared.

The purpose of using vignettes in this research was that it allowed for a less invasive method of exploring how teachers would teach research in the classroom, without requiring lesson plans or lesson observations. This decision was made, as it would be easier to find participants who were willing to take part in interviews and answer scenario-based questions, as it would take up less of their time and they would not feel like they were being assessed and therefore more likely to respond truthfully. Vignettes are most typically used in social research, as they provide a 'valuable technique for exploring people's perceptions, beliefs and meanings about specific situations' (Barter and Renold 1999).
The textual analysis was conducted on curricular documentation from Education Scotland, to gain a broader understanding of information literacy within the Scottish education system. This analysis also revealed what information teachers have been receiving on information literacy and what terminology they are familiar with. This analysis was important for creating a context for the teachers' references whilst responding to the vignettes.

3.2 Interviews

Qualitative research was conducted through semi-structured interviews with secondary school teachers. The interview guide was prepared with a list of open-ended questions, along with definitions of information literacy and CPD which were given to the participants to ensure that they agreed and understood both terms. It must be noted that the definition of information literacy was given to participants after they had been asked to attempt to define it themselves.

Teachers from local secondary schools were invited to participate in the interviews and from the volunteers, a selection was made which included a variety of different subject areas and a range of teaching experiences. Only a small number of teachers selected to take part, from two secondary schools. However, they meet the criteria of teaching different subject areas and were considered diverse enough to be eligible to take part in this research. In addition to five teachers, one Deputy Headteacher was also interviewed, which gave a management perspective on information literacy and CPD. This was not initially part of the research proposal and planning but provided an opportunity to gain insight from an experienced teacher and to develop a clearer understanding of how CPD is organised within that school.

The interviews were conducted in the participants' classrooms or offices, to help them feel relaxed during the interview process and were conducted during either a free period during the school day or after school had finished, depending on what was most convenient for the participant. They were recorded and transcribed, having received permission from each participant.

Although conducting interviews resulted in the gathering of only perspectives from six teachers, it allowed for more meaningful exploration, and over the course of the interview, it was clear that the teachers were thinking deeply and reflecting on information literacy and how they conduct their CPD.

3.2.1 Interview questions

The interviews began with questions based on participants background facts and only required simple shorter answers; with questions gradually building in complexity. Initially, questions focused on basic information which had to be gathered, such as educational background, work background and current teaching role. The questions gradually became more opinion based and more complex. The term information literacy was not used until nearer the end of the interview, as it was suspected to be a term which participants would not be familiar with. The interview process was kept as relaxed and comfortable as possible for the teachers involved with the most invasive questions in the form of vignettes being used to end the interviews.

Largely the same questions were asked of each teacher, with altered questions for the DHT.

3.2.2 Interview participants

To ensure anonymity the teachers were identified by the main subject that they taught, and the order presented here reflects the order which the interviews were conducted. Background information about their education and careers is given to provide a context for their interview answers. The Computer Science teacher and Support for Learning Teacher both worked in the same secondary school, likewise the other three teachers also all worked at the same school as each other.

3.2.2.1 Computer Science teacher

The Computer Science teacher is dual qualified and had previously taught Technology. She had studied a bachelors and MSc in Architecture, followed by an MSc in Property Management, a bachelor's in commerce and had worked as an Architect for fifteen years. Her final degree was an MSc in education, which resulted in her career change to teaching, thirteen years ago. Initially, she taught technology but had been teaching Computer Science for the last four years after a brief period working in Support for Learning.

3.2.2.2 Support for learning teacher

The Support for Learning Teacher had been teaching for twenty years. She is a qualified English and French teacher, having studied both subjects as an undergraduate and later receiving a degree in French from a French University. After which she taught the English language to adults before completing a PGDE in secondary education and becoming support for learning teacher.

3.2.2.3 Deputy Headteacher

The Deputy Headteacher had been in post for six and a half years, having previously taught Modern Studies. He has 35 years' experience as a teacher and entered the profession after completing a degree in Modern Studies and Economics. Alongside teaching, he is an active trade union member and of the Scottish Secondary Teacher Association.

3.2.2.4 Technology teacher

He had been teaching for 14 years, 9 of those years were teaching abroad in International Schools. Before working as a teacher, he was a carpenter for 10 years and a construction site manager for three years. Recently back from teaching abroad, he had been back teaching in Scotland for a year and a half.

3.2.2.5 Science teacher

At the time of taking part in this research, she had been teaching for three years, including her probationary year. Having studied an undergraduate degree in Biology, specialising in genetics, she teaches general Science to S1 and S2 and Biology to all year groups. Before commencing her PGDE in secondary education, she taught English abroad and spent a few years working and saving for her qualification in teaching.

3.2.2.6 History teacher

The History teacher had been teaching since 2009 and had predominately taught history, whilst teaching other social subjects to S1 and S2 classes. He is also qualified to teach core RME up to level 5 and spent last year on secondment in support for learning. His career in teaching commenced immediately after graduating in history and education, which allowed him to move straight into his probationary year.

3.2 Vignettes

The use of vignettes allowed for participants to respond to fictitious situations, by answering what they would do in such a situation. This proved useful for exploring teachers' perceptions of information literacy without relying on them already having formed a clear definition of its meaning. This meaning can be explored and developed through their responses to the vignettes.

Vignettes have been described by Hughes as 'stories about individuals, situations and structures' resulting in an understanding of their beliefs, attitudes and perceptions (cited in Barter and Renold 1999). A similar definition is given by Finch who describes them as 'short stories about hypothetical characters in specified circumstances, to whose situation the interviewee is invited to respond' (cited in Barter and Renold 1999). For them to be effective, the stories used must be plausible and depict realistic situations which will feel real to participants (Neff cited in Barter and Renold 1999).

To ensure that participants would engage well with the vignettes, situations which they are familiar with were described. The storied used avoided depicting disastrous events and unusual occurrences so that responses given provided relevant data to the research being conducted (Finch cited in Barter and Renold 1999). A fine balance had to be struck between, providing a clear context and allowing the scenarios to be vague enough to allow participants to provide their own additional factors (Barter and Renold 1999).

There are, however, some issues in the use of vignettes when exploring participants definitions and evaluations, as the scenarios used can influence their responses. Due to this issue, vignettes formed the concluding section of the interviews.

Participants were asked how they would respond to situations and then if they have encountered a similar situation before and if so, to describe it. The phrasing was important, as they should respond with how they personally would react and not answer hypothetically how a person might respond. It is important that they are asked after their first answer if they have encountered similar situations before and not the other way around. This is to ensure that participants do not feel like they are being judged or assessed.

The use of vignettes ensured that the participants would not feel like their teaching was being assessed and was less invasive than lesson observations and looking over lesson plans.

3.4 Textual analysis
The textual analysis was an important element of this research, as it allowed for comparison between participants understanding of information literacy and their CPD, with the guidelines and documentation that is available to them from Education Scotland. This creates a broader perspective, which is essential for this research, due to the small scale of teachers interviewed.

The textual analysis provided context for the teachers' responses to the scenarios they were presented with. They often answered by referring to specific examples of what they had previously taught in the classroom, and the textual analysis further supported the information gathered.

3.5 Data analysis

3.5.1 Interviews
The interviews were transcribed onto word documents with the assistance of the online software Transcribe (undated). Rom the transcripts keywords and phrases relating to the aims of this research were searched for and then grouped under thematic headings to allow for patterns to be observed and for different participants responses to be analysed and compared. The thematic headings were:

information literacy understanding, confidence in information literacy practice, information literacy development prior to teaching, information literacy development as teachers, relevance and importance of information literacy, dislike of Wikipedia, CPD definitions, Forms of CPD and lifelong learner definitions. This technique allowed for common themes to emerge and for comparisons between teachers attitudes and understanding of information literacy, and methods of CPD to emerge.

3.5.2 Vignettes analysis method

A different approach was used for analysing participants responses to the vignettes. Each scenario was analysed independently, and summaries were written of all participants responses and from these summaries' comparisons were made by locating themes (Harding, 2013).

3.5.3 Textual analysis method

The following documents from Education Scotland were selected for analysis: Building the Curriculum one, two, three and four, and the Experiences and Outcomes for levels two, three and four.

The textual analysis was conducted using the concept of open coding. Initially, all curriculum documents were read through and a basic understanding of the terminology and phrasing of information literacy skills was generated and used to help form search terms. These phrases were searched for in the document using the Ctrl + F find function. However, these results needed careful examination to ensure that they related to information literacy, by reading the context in which it referred. For example, the search term 'investigate' produced some results which could not be included in this research, as it referred to scientific investigations, referring to experiments and analysis of results. Arguably this is an analysis of information but does relate directly to information literacy as defined within this research. For a thorough and accurate textual analysis, the whole range of documents was initially read and the most relevant selected for analysis.

3.6 Literature searching

To meet the first object, a review of relevant literature which has been published in the last 10 years (2008-2018), provided a background understanding of teachers' CPD, perception of information literacy and information literacy within a broader context. Older works were included when they proved to be relevant and to show the progression in how information literacy has been defined and understood.

Searches were carried out using Boolean keyword strategies and when suitable articles and resources have been found; forward and backward chaining was used to find other related literature. This proved beneficial when reading older literature and for checking sources referred to in an article. Several types of literature will be included, such as; peer-reviewed journal articles, books, theses, conference papers, annotated bibliographies, case studies, Education Scotland publications and websites. The main search terms used were combinations of information literac*, teach*, CPD, professional development, context*. Key texts were selected and from them, the majority of other useful references were found.

3.7 Ethical Considerations

The most important ethical consideration for this research was ensuring the anonymity of participants, which helped create trust during the interviews. No names are used to protect interviewees identities and the names of schools are not given. The participants have been named by the main subject that they taught, as this information was deemed important to the research. Work which involved listening to recordings or referring to interview notes occurred in a private space and recordings and transcripts

remain confidential and will only be available to Robert Gordon University for the purposes of assessment if requested. After the submission and marking of the dissertation, the sound recordings and transcripts will be deleted. A contract stating all the above was signed by the researcher and participants, to ensure that the teachers would know what would happen with their personal details and the recordings of the interviews.

4. Results

4.1 Interview results

4.1.1 Introduction

How CPD is defined, what activities count towards a teachers' professional development and how their CPD is measured varied across the interviews and was not always consistent with education policy. Teachers professional learning is monitored by the General Teaching Council for Scotland (GTCS), which requires teachers to undertake a minimum of 35 hours of CPD annually, as well as undertake annual reviews and complete a professional update every five years (Scottish Executive 2003).

There are different Professional Standards which teachers self-evaluate against, depending on the position of the teacher, these standards are; standard for full registration, chartered teacher CPD which is for highly experienced teachers, CPD for Educational leaders which is for teachers who are in a senior position and the standards for Headship which applies to Headteachers (Scottish Executive 2003). Teachers are also required to undertake an Annual Professional Review during which teachers discuss with their manager or principle teacher the CPD they have undertaken and reflect on its impact (Scottish Executive 2003). Every five years they must also complete a professional update which is connected to teachers professional learning and annual reviews, as it is the submission of their record of learning (GTC Scotland undated). The procedure which teachers follow is important for this research, as it relates to how they understand and carry out their CPD requirements.

4.1.2 CPD definition

The definition provided by Education Scotland states that 'A CPD activity is anything that has progressed, assisted or enhanced a teacher's professional practice and might include issues of personal development as well as specific educational issues' (Scottish Executive 2003 p.11). This definition is very broad, as it mentions personal as well as professional development. However, all participants agreed with the CPD definition read to them at the beginning of the interviews and no queries or disagreements were raised. During the interviews, none of the participants mentioned any specific personal development they were undertaking during their CPD, preferring to focus on professional development.

4.1.3 Teachers' understanding of CPD

Overall, participants focused on formal types of CPD far more than informal. Informal forms of CPD were discussed briefly and not always in direct relation to CPD, but whilst answering questions about information literacy.

CPD which was discussed during the interviews were: secondment to different teaching opportunities, keeping updated on changes to courses and exams, attending in-service day workshops, carrying out individual online research and watching educational videos, reflecting on their learning and training in new technology. The most discussed form of CPD for teachers was in-service day workshops and keeping up-to-date on changes to the curriculum.

Even when the interview was steered towards informal CPD, teachers were more vocal on the topic of workshops and several were dismissive of some informal CPD, considering it as not officially

counting as CPD. The History teacher gave the most varied response when asked to provide examples of CPD, listing: in-service day workshops, keeping up-to-date on the latest changes and learning and using new modes of technology such as teams on office 365 and GLOW connect (https://glowconnect.org.uk/). The Science teacher also when asked to provide examples beyond workshops and in-service day activities, mentioned the collaboration with colleagues which involved trying out new experiments. She described the process of researching experiments, watching demonstration videos on YouTube, and then gathering with colleagues to share their ideas and attempt the chosen experiments. Collaboration and learning conversations were also mentioned, for when she required guidance, she would "just go and ask one of the other teachers."

The Technology teacher had a different opinion on learning conversations and explained that these experiences would not be recognised as a form of CPD, as it could not be evidenced. He also discussed how teachers would often converse about work matters and share ideas and areas of difficulty. Although he considered this to be important, he did not consider it to count as CPD.

The greatest discrepancies in the understanding of CPD can be seen between the teachers and the DHT who was interviewed. Despite all agreeing with the definition of CPD given at the start of the interviews, all preferred to discuss formal CPD, such as workshops. This preference for workshops was an issue raised by the DHT during his interview and also was raised in a government report from 2016 which found that teachers focused their CPD mainly on courses which they took.

The DHT however, gave wider examples of CPD and considered certain elements which some other teachers dismissed as not counting as actual CPD. Examples being; watching YouTube videos on educational content and reflecting on how this could be used to develop your teaching. Due to his length of service as a teacher, the DHT was able to explain partially why some teachers would be dismissive of informal CPD, and not crediting this as being as relevant or as important as attending workshops and organised learning experiences. Historically, CPD was more rigidly assessed by counting hours and providing evidence of what CPD had been undertaken, hence teachers liked attending workshops as it provided this evidence and was easy to count the hours of CPD which had been undertaken. The DHT described CPD as having gone through a change in mentality, as previously teachers had to evidence the hours and what CPD they had undertaken. He was supportive of the change in how CPD is recorded, as he stated, "it is the enquiry, it's the considering things. Rather than attending". The DHT considered all the examples of CPD given in the definition to be equally valid as forms of CPD. He stressed the importance of reflection on learning and development, rather than the attendance of training. He also spoke of having actively discouraged teachers from attending workshops which will not be beneficial to them and to think carefully about whether a training event is actually always the best way of enhancing their teaching practice.

The Computer Science teacher also spoke more broadly about CPD when she talked about her role as a mentor to probationary teachers. Prior to that point, she had focused her examples of CPD heavily on workshops. However, like the DHT, she was happy to discuss how she helps guide probationer towards the form of CPD which could help them develop a targeted area of their teaching; by selecting appropriate reading materials, "Like give them books to read, videos to watch, whatever courses to go on. You know, it is a bit more supported than just your own individual thing."

Despite considering workshops to be their main form of CPD, teachers discussed the limitations of this form of CPD, due to it often not being directly tailored to their developmental needs. The Technology teacher referred to the contrived nature of discussing what their professional development areas may be, due to teachers only being able to go on available workshops. This was a valuable point which was also raised by the Computer Science teacher. Although this is a valid point, neither mentioned the possibility of undertaking other forms of CPD to assist in the areas which they felt could be developed

further. The limitations of workshops and courses were also discussed in the qualitative research conducted by the government, who concluded that one-off courses resulted in the least impact, as teachers found it challenging to apply what they had learnt to their own classroom practices (Black et al. 2016).

The formality of the professional learning process for teachers explains to an extent some teachers understanding of CPD, as they are concerned with how to evidence their learning experiences. The government report did note an increase in professional development which involved professional dialogue, reading and reflection, although the report found this result to not be entirely reliable as they suspected that this indicated an increase in recording of this forms of CPD, rather than an increase of these forms of CPD (Black et al. 2016). The teachers interviewed did mention reading, conversations with colleagues and demonstrated reflection, however, they did not seem as concerned with these forms of CPD and had to be encouraged to discuss other forms of CPD, beyond workshops.

4.1.4 Importance of CPD

All teachers shared the feeling that CPD was important for all teachers, no matter what stage of their career. One participant admitted to the feeling of reluctance at times to complete CPD, due to workload but spoke of its benefits and how it was essential. The participants linked CPD with keeping up-to-date with current pedagogical practices and changes made by the SQA (Scottish Qualification Association) and the necessity of knowing current information within education. The process of Professional Review and Update is considered essential for providing guidelines and framework for teachers to identify their CPD needs (Scottish Executive 2003). Teachers in the interviews stressed how important it was for the workshops and in-service day events that they attended, being related to their specific needs. The Computer Science teacher and Technology teacher both mentioned the negative impact compulsory attendance to certain CPD events can have on teachers when the learning intentions are irrelevant to the CPD needs they had identified during their annual review and professional update. The Computer Science teacher complained of one such incident being an outdoor learning course all teachers were obligated to attend. Although she did not object to the notion of outdoor learning she felt it was irrelevant as she stated, "I'm never going to be allowed to do it so why am I doing this course?". This issue of choice and relevance was also raised in a government report on teachers which found that professional development was being overly driven by National and Local Authority priorities, instead of the needs identified by individual teachers (Black et al. 2016). The consensus from both the interviews and government report being that CPD was extremely important but only when relevant.

4.1.5 CPD and lifelong learning

All the teachers who were interviewed expressed strongly that they were lifelong learners. The History teacher emphasised that "lifelong learner is something that is just natural. Everybody is doing it.". Similarly, the support for learning teacher explained, "everyone is a lifelong learner".

The importance of continual development and learning as a teacher was a belief held by all. The Computer Science teacher expressed the concern that: "it is very easy, especially in teaching to just sit back and do nothing and then one day you wake up and you haven't a clue what is going on around you because it is changing". The fast-pace of education was felt by all participants, and therefore this forms a key component of the CPD which they undertake. The Support for Learning teacher also talked about the need for teachers to be self-sufficient, as they receive very little guidance when starting a new post/job role. This self-reliance meaning that they must be able to find out information from different sources, including communicating with colleagues, research and reflection. Overall, it was unanimously agreed that teaching is a lifelong learning experience.

4.1.6 Teachers' definitions of information literacy

All participants were asked to try and think of a definition, and some characteristics they would assign to the term information literacy before they received the definition given by CILIP.

Each teacher interviewed responded uniquely to this question, and some understood the question as being specifically related to within teaching. The Technology teacher interpreted in relation to teachers' information literacy:

> You have to think outside the box. You have to have the ability to absorb a lot of information but then, more importantly, refine that information into a condensed form that you can use effectively in the classroom.

This was in align with the concern and emphasis he placed on teachers' time-limits and need to prioritise their workload. Being able to consume information quickly and convenient was important to him. The other teacher who strongly related their answer to teaching was the History teacher who used examples from his teaching experience to elaborate on his definition. However, he also gave a broader definition as well, defining information literacy as being able to make sense of information and knowing where and how to find information. Knowing where to go for information was also discussed by the Computer Science teacher, who defined an information literate person as someone who "knows where to look for information, knows who to go to find it". The support for learning teacher responded similarly with: "Somebody […] who don't know the answer but who can try different routes to find out something". The participant who gave the most accurate and in-depth definition was the Science teacher who defined it as:

> Somebody who can identify what information you need to find and then actually go and look for it. Decide if, once they have found something if it is reliable and sort of accurate and actually valid to what they are doing.

They all were able to define the basic concept behind information literacy and link it to their teaching.

4.1.7 Teachers' perspective on their Information Literacy

When asked to provide an example of research they have conducted for work or for leisure and to evaluate the success of this research, all participants expressed confidence in their searching ability to varying degrees. Presented here in descending order of confidence and the level of complexity of their research, starting with the participant who demonstrated the most confidence and complexity of research skills.

The Science teacher expressed the most complex research skills in the example she provided and was very confident in her information literacy ability, due to her recent experience of using databases for research whilst writing an essay for her MSc in Education. She described the process of having to narrow down the information she found, as there were lots of articles available on the topic which she was searching for information on - literacy and travellers. Her technique for doing this was to evaluate the articles, based on who had carried out the research, looking for names she had heard of and by checking their references. This kind of research and development of her own information skills resulted in her being confident in speaking about her research abilities and able to demonstrate how she uses these skills. However, she also talked about how high school had not equipped her for the challenges of research at university, and how she felt it was only whilst studying for her MSc she truly developed this confidence.

Also demonstrating confidence in their information literacy abilities, was the History teacher who elaborated on the numerous occasions and frequency which he had to undertake research as a teacher and also particularly because of the subject he teaches being history which requires the ability to source and evaluates sources carefully. He answered as being satisfied with the information he managed to find and evidenced this through the example of work he has had to research on dyslexia

being submitted to the Prince's Trust which was considered satisfactory by them. He commented that his research was continuous and that he was still digging for information. Over time his research process may become more complex, the further his research goes. Similarly, the Computer Science teacher would have been able to give many examples of research and demonstrated confidence in how she discussed specific research engagement and how it was very deeply embedded into her work as a teacher.

The Support for Learning teacher provided examples of searching for information on attachment theory, which was relevant to her work and also her personal research into the best diet for cats, particularly whether chicken is good for their health or not. She was confident in the information she found on attachment but was less certain of the quality and reliability of the information she had read on cat food. She demonstrated skills in evaluating the reliability of a website by questioning its reliability as she was unsure of who had actually written the information on the website and whether they might be biased and not giving impartial information to try and sell a product.

The Technology teacher gave an example of professional research that he was required to undertake as part of a course he was completing. Although he was not directly asked how happy he was with the information he managed to find, he demonstrated the success of this research by explaining how beneficial he had found the information and wishing he had known this information whilst he had been in a management position. This clearly demonstrates that his research was successful, and he was confident that his sources were relevant and reliable.

All of the participants realised the frequency in which they conducted research and considered it key to continuously developing their teaching practice. Some were able to talk about specific techniques they used and demonstrated specific skills such as evaluation of sources.

4.1.8 Information literacy development from prior experiences
Participants discussed how they had developed their information literacy, with all referring to their time studying at university. However, they all had different experiences of how effective they found their time at university being, for their information literacy development. The Support for Learning teacher spoke about her research at university being book based, as it was before the internet and computers were used for researching information. Having studied in France, she also had experienced difficulty in searching for information as whilst using the university library the requests for a resource had to be made to a member of library staff.

The Science teacher was reflective on the information literacy skills she had developed through her undergraduate in Biology and considered herself successful in the technical aspects of searching for information but poorer at analysis. She described her bad habit of highlighting whole sections of information and not being as careful to only highlight the key information. Her ability to think critically about which aspects of information literacy she is strongest and weakest in demonstrated her overall awareness of information literacy. Interestingly the History teacher also spoke about developing his research skills at school and credited his skills to having studied history at school and then university, recognising how the research skills he developed as a historian as being transferable skills.

The Computer Science teacher felt that she had largely developed her information literacy skills from her time at University, particularly during her postgraduate courses, stating, "and it was only when I was studying at that level that I really kind of got any sort of input or training into how or experience or how to be information literate."

However, the Technology teacher was the only participant who felt that he had not formally received any specific support to develop his information literacy skills and claimed that it was always "make it

up as you go along". He described teachers as being the type of people who have it "pretty much ingrained […] without the training".

Overall, the participants apart from one, felt that studying at university had instilled skills and enhanced their ability in information literacy. Although one did feel that some of her information literacy skills learnt from university were not as current, as it was before the internet.

4.1.9 Should they have CPD in Information Literacy?

Although the teachers were confident that they are information literate, they did not consider themselves to have received any guidance through their teacher training or CPD, to develop skills in this area. Some argued that teachers should already have well-developed information skills from completing an undergraduate degree. The Technology teacher had stated that it is "something that we actually have I think deep down already".

Some, like the Science teacher, thought that an optional refresher might be beneficial for some. Similarly, the Support for Learning teacher, although initially dismissive of the idea of teachers needing any guidance, changed her mind, considering that just because teachers are managing without support does not mean they should not receive support – "So maybe it would be good to have some kind of guidelines or something". She formed the argument that teachers have had to develop their own information skills as they are expected to teach pupils how to conduct research. The History teacher considered information literacy to be something which teachers were already developing with their classes and considered the main benefit of teachers receiving training in it, would be that it helps them formally recognise what it is they are teaching pupils and gives a name to what they are already doing. He claimed, "I imagine that most teachers are naturally doing it already". The Science teacher also explained that it would be assumed, that as a teacher, you must already be information literate as you have a degree plus a teaching degree. She expressed the opinion, "if you don't know how to do it by now, you are in trouble".

Due to having attended university, the teachers expected this to have provided them with enough information literacy skills to not need further CPD opportunities to develop information literacy. However, some expressed the opinion that it may be beneficial and would be more of an optional refresher course for those who feel they could benefit from it. This aligns with participants discussion of CPD being conducted on their individual requirement needs, therefore in theory, other teachers may require further support in developing their information literacy.

4.1.10 Relevance of Information Literacy

The teachers who were interviewed, all expressed the belief that being information literate was important for modern society. They spoke about how researching and using information was something which was constant within their lives and therefore constant for pupils also. The Support for Learning teacher claimed, "well actually I do it all the time" and about using technology such as her mobile and the internet, as a readily available way of searching for information.

The History teacher lamented the issue of adults as well as pupils not using reliable sources of information. The example he gave involved the film Braveheart to argue points about Scottish history and the life of William Wallace, and how even adults sometimes use the film for historical information. He argued the point that "we have quick access to all this information and yet we seem to take a lot of it too much for granted and so being as you say, information literate, I suppose is a very important aspect".

The Science teacher spoke about the particular importance of being information literate for senior pupils (S5 and S6) as they have to conduct research and use sources of information for report writing whilst referencing their sources. A key skill which they need to develop is the ability to locate the key

bits of information they need from a source and to be selective. She gave an example from how she guides pupils through this process - "ok so this is a good article, you are not going to understand this section but that is ok because you don't need that section. Make sure you understand these bits and then you can use it." Instilling information literacy in his pupils, through enquiry-based learning, was an issue raised by the Technology teacher. He claimed that pupils were struggling with enquiry-based tasks he gave them as "it is a concept that is completely alien to them because they are so used to being given the information".

In none of the interviews, were the participants asked about fake news or to give examples from real life of issues which relate to information literacy. However, all apart from the Science teacher whilst answering various questions brought up fake news, demonstrating their ability to connect the discussion about information literacy to life skills and lifelong learning. This suggests that teachers are already concerned about information literacy and considering which skills are essential for instilling in their pupils. The History teacher claimed that due to fake news: "it is more important than ever today, that you analyse where that piece of information came from and whether or not it is reliable." The Computer Science teacher actually discussed a lesson she does with second-year pupils on the topic of fake news, as she considers this to be a relevant and important factor and also an engaging way of teaching the purpose of evaluating sources.

4.2 Vignette results

4.2.1 Introduction
Three different scenarios were presented to the participants, with the purpose of exploring their perception of information literacy within secondary education and which aspects of information literacy they consider to be relevant and important.

4.2.2 Scenario 1
Scenario One presents a teacher introducing a new topic to his class by asking them to undertake some research on the topic as homework and to come to class with a few facts within the area of the topic. The purpose of this scenario is to find out what the participants would provide as guidance to their class on undertaken a basic but very broad research task like this. The responses indicate what the participants consider as essential skills to have for information literacy and how much help they think pupils would require. Such as would they expect pupils to need any guidance, or would they want to provide information sources to look.

The Science teacher gave an example using the topic of renewable energy, which is part of the curriculum she teachers. She explained that she would provide guiding questions for their research, to give them a focus, otherwise the information they might gather, could end up being inaccurate. However, she was happy for pupils to search the internet freely for information, as it would generate interesting discussion. For example, some might get their information from companies advertising services and this could form a discussion on evaluating sources of information.

The Computer Science teacher also responded to this scenario by giving a specific example of some research she undertakes with S2's on fake news, which has the purpose of getting pupils to think critically about information. The pupils are tasked with finding out if a piece of sensationalist news is true or not and from this will learn how to assess their information. She also discussed teaching them how to form search terms, as she finds pupils do not think carefully about what they type into search bars.

The History teacher spoke the most about how much preparation would be required for pupils to successfully be able to complete this task. He spoke about creating a worksheet which would detail research methods and how to effectively use Google. Also differentiating for those who need more

support, by giving examples of reliable websites. However, he would want the pupils to find information from different websites, so that they develop enquiry skills. He claimed it would be too easy for pupils to be given a website to just copy information from. He would use this task to develop critical thinking, asking pupils if sources are reliable and how have they assessed them on reliability. The Support for Learning teacher admitted that it would depend very much on pupils' abilities, on how much guidance they would receive. Sometimes providing websites to use for the information would be required otherwise, guidance on how to assess information for reliability and quality would be enough and required before pupils could undertake their research.

Taking a different approach to the other participants, the Technology teacher emphasised informing the pupils of all the different sources of information available to them, including using the library and asking friends and families for information, as well as the expected Google. He would want them to try and gather from multiple sources and would give an expected time frame, as he was aware that pupils could spend many hours hunting for information.

4.2.3 Scenario 2
The next scenario builds upon the first and requires the participants to justify why information literacy skills need taught, instead of allowing pupils to search without guidance. The purpose of this scenario is to check the level of importance and relevance the teachers' place on research skills and to what degree it is required to be taught by them.

The Technology teacher approached this scenario, realistically, as what would most likely cause a pupil to argue that they don't need help to complete this task. He would emphasise that this will build upon the knowledge they already possess, and the teacher should continue as they had planned, in teaching research skills. The Support for Learning teacher also responded that it would be essential for pupils to receive guidance, particularly the pupils that she supports. She mentioned tools and resources which help simplify webpages for those on the autism spectrum or have ADHD. The pupils have some internet skills, but they will mainly be on gaming websites and not specifically relating to enquiry skills which would help them complete the task set in the scenario.

Agreeing with this argument about pupils' ICT skills, the History teacher explained that he would expect them to be able to use a computer for research but that their search techniques would not necessarily produce the best search results. He would also want the pupils to consider other sources of information such as books or depending on the topic, perhaps speaking to someone who is knowledgeable in that area. The example he gave is asking someone who had seen 9/11 on the news, rather than reading accounts from the internet.

The Science teacher responded from a different angle, stating that she could expect them to be competent in finding information and judging it, as they are being taught these skills regularly. The Computer Science teacher agreed that pupils would likely consider themselves already competent but are not as much as they believe. She considered some enquiry-based tasks she has given S2 pupils "around the world in 80 clicks" and discussed the challenges pupils had in answering questions set by their teacher.

4.2.4 Scenario 3
The final scenario revolves around the marking of the homework and asked the teachers to consider how they would want the information presented. Would they find it acceptable for pupils to merely find the information and copy it, or would they want to ensure pupils understanding of information by ensuring that they have not plagiarised?

All participants responded to this scenario by saying that they would either refuse to mark the homework or would reward a zero and were concerned to varying degrees over the issue of plagiarism. The Technology teacher considered plagiarism to be an important issue and stated that pupils should be instructed not to merely copy and paste. This displays that he is concerned with pupils synthesising information, although he mainly talked about the issue of plagiarism, as opposed to ensuring that pupils have understood the information which they have found.

Although the Science teacher also said that she would mark the homework as receiving zero credit, she spent time explaining why she would want pupils to not copy and paste. The Science teacher described the process of "analyse, reformate and try and add something to it" and spoke of putting it into different contexts when appropriate. She related these information skills to how pupils memorise scientific information, and how this is only beneficial if they can apply this information to the questions they are asked – which might be in a different context. The History teacher was also concerned with plagiarism, but it was linked to his concern over the missed opportunity to develop understanding, and he would refuse to mark the homework due to it not really being the pupils' work. He was concerned that copying and pasting do not demonstrate understanding - "But it is important because if you are copying and pasting, you are not information literate, you are just seeing". His argument was that the process of rephrasing the information would mean that pupils are more likely to retain and remember it. He considered being able to find relevant information, as not demonstrating information literacy fully, as understanding and using the information correctly was also of importance. The Support for Learning teacher was much less concerned with plagiarism and more with pupils lacking the confidence to synthesize the information. She felt that pupils will not want to rephrase something which has been well written and may struggle with analysing it for the key information, saying' "to take out the key meaning from it. It is a difficult skill I think".

The Computer Science teacher mentioned plagiarism the least, as from her experiences teaching, she would correct the pupil and point out their error in copying pasting someone else's work. Instead, she spoke about the application, read and write chrome and its highlighting function which helps pupils pick out key information from digital resources and then groups the highlighted sections. This feature helps them make sentences from the key points of a text and emphasise the skills of selecting key information and rephrasing to ensure understanding. All participants considered copying and pasting to be unacceptable and as something which they would discourage pupils from doing.

4.3. National curriculum analysis

4.3.1 Introduction

In order to provide context for the teachers who were interviewed, and to develop an understanding of how information literacy relates to their teaching, textual analysis of the curriculum has been included in this research. The Curriculum for Excellence consists of several key documents for teaching and supporting documents which examine concepts relating to the curriculum. For this research: the Building the Curriculum documents, and the Experiences and Outcomes were analysed to discover how the curriculum approaches the teaching of information literacy. The experiences and outcomes is the key document which supports teachers in planning and delivering the curriculum (Scottish Executive 2017). Experiences refer to the learning experiences which are designed to develop attributes and capabilities and the outcomes represent what is achieved through the learning experience (Scottish Executive undated). The curriculum has been grouped into eight curriculum areas, which are: expressive arts, health and wellbeing, languages, numeracy and mathematics, religious and moral education, sciences, social studies and technologies. As well as the following curriculum areas which are considered to be part of pupils' broader education: health and wellbeing across learning, literacy across learning and numeracy across learning. Documents which explain important aspects of the curriculum design are the five Building the Curriculum documents, which

consider the following aspects of the curriculum: the structure of the curriculum, active learning, skills for learning, work and life, and a framework for assessment.

Within these curriculum documents, certain sections were not included in the textual analysis as they were not considered relevant to this research. Classical languages and Gaelic were not included as these subjects are not taught in any of the schools, where participants taught. The experiences and outcomes of these two subjects covered the same skill development as either English and Literacy or modern languages. Also, not included were the Roman Catholic experiences and outcomes as they are only relevant to Roman Catholic domain schools. Early and first level Experiences and Outcomes were not included in the textual analysis as they are aimed at primary level and not relevant to secondary teaching.

4.3.2 Information Literacy within the curriculum
Before commencing research, a brief read through of the curriculum was undertaken, to provide context and a general understanding of teaching and learning in secondary schools, which revealed that the term information literacy did not seem to appear in the documentation.

The following list of abilities of information literacy was used as a basis for analysing the content of the curriculum documents for evidence of information literacy, 'how to discover, access, interpret, analyse, manage, create, communicate, store and share information' (CILIP 2018 p.1).

Although the terminology was different, information literacy proved to be across most curriculum areas, but under the terms of research and enquiry-based learning. The most common terms relating to information literacy which were found within the curriculum were: 'research' and 'investigate'.

Due to the term information literacy not appearing in the Curriculum for Excellence documents which were analysed, it is not surprising that it was not a term which any of the participants were familiar with, apart from the Science teacher who had explained she was aware of the term, as it was mentioned in documents she had read during her MSc in Education.

4.3.3 Information Literacy within Curriculum Areas
The term information literacy does not appear within the Curriculum for Excellence, despite the numerous occurrences of researching information, analysing sources, and the presentation of information. Information Literacy under different terminology appears throughout the curriculum for excellence but appears most frequently in the subject areas of Literacy and Social Subjects.

Those who teach social subjects must cover the selection of sources, evaluation of sources, comparison between different sources, critically analysis of information and use the information to form arguments and provide evidence. Within social subjects, they focus on developing analyses and evaluative skills which relate to information literacy.

Literacy across the curriculum teaches broader information literacy skills such as taking notes from sources of information, identifying and selecting relevant information from a source, evaluating information, summarising, distinguish fact from opinion, and using information in different contexts. These skills are the foundation for information literacy and are transferable abilities which will be needed broadly across the curriculum.

However, some areas of the curriculum do not specifically teach information literacy skills. The following subject areas covered information literacy the least: Expressive arts, Modern languages and Mathematics.

No explicit references were made to information literacy skills within the curriculum area of Expressive Arts. Mathematics only had two experiences and outcomes which mentioned researching information. However, numeracy across the curriculum had eight. The next curriculum area which mentioned terms relating to information literacy the least was modern languages, which only had four references. The experience and outcome MLAN 4-09a requires pupils to undertake research, and in MLAN 2-12a/3-12a/4-12a requires them to use reference materials. Although these subject areas do not contain many experiences and outcomes which relate to information literacy skills, those who teach these subjects may be required to teach elements from literacy, health and wellbeing or numeracy across the curriculum.

4.3.4 Information literacy and higher order thinking

The connection between information literacy and higher order thinking skills, as described in Blooms revised taxonomy, was discovered through the analysis of the building the curriculum documents. In the Building the Curriculum Documents, references are made to information literacy skills and how important they are for pupils developing higher cognitive abilities. Synthesis of information is prized as being key to higher order capabilities within Building the Curriculum one, as pupils will be taught how to 'interpret evidence to create meaning' (Scottish Executive 2010a p.14). Depth of learning is one of the seven principles of the curriculum's design, and one example of depth in learning refers to more complex understanding and application of information, as opposed to the mere acquisition of facts (Scottish Executive 2010b). This signifies that the curriculum design wants pupils to be able to analysis and synthesis information, even when it is presented to them by their teachers. One of the key areas where investigation and research projects occur is during interdisciplinary learning that will cover different areas of the curriculum and focuses more on skill development than knowledge development (Scottish Executive 2008).

One of the main objectives of the curriculum for excellence is to prepare pupils for their future and life beyond secondary school. In order to prepare pupils, they are taught how to make informed choices and decisions based on information (Scottish Executive 2008). They will be taught how to plan for their future by using information to consider their work and educational pathways (Scottish Executive 2009). Researching information on future pathways is developed in the health and wellbeing area of the curriculum. Information literacy appears within the curriculum documents both as specific skills development and more broadly in relation to higher order thinking and life skills.

4.3.5 Conclusion

Although the term information literacy does not appear in any of the curriculum documents which were analysed, the skills and abilities which partly define information literacy appear in most curriculum areas. The fundamental skills of; summarising information, note taking and sourcing information appear within literacy. The following phrases relating to information literacy appeared during analysis: research, identify sources, compare and contrast, interpret, sum up, identifying key points, make informed choices, support with evidence, use information for different purposes, show understanding, distinguish fact from opinion, recognise bias, investigate, evaluate information, analyse information, present information. The Scottish curriculum clearly requires information literacy to be taught, despite not acknowledging this by grouping and naming these skills and capabilities as being information literacy.

5. Discussion

From this investigation, it can be established that teachers were unfamiliar with the term information literacy. However, despite being unaware of information literacy, teachers demonstrated an understanding of the core elements of information literacy and recognised it as an important life skill.

It was also clear that teachers were not being supported in developing their information literacy through CPD, and that they were not fully comfortable with informal CPD.

5.1 Information literacy

The results on teachers understanding of information literacy were only partly similar to those from Probert (2009) study which found that teachers were unfamiliar with the term information literacy and defined it through either literacy and reading, or literacy and ICT teachers' definitions of information literacy. The History teacher had broken his definition down into literacy and information but none of the participants followed the same pattern of definitions as found in Probert's study. Several participants also mentioned a wide variety of sources of information which did not require digital technology, such as verbal communication and printed resources.

The investigation also attempted to gather information on teachers' confidence in their information literacy by asking about specific examples of research they had conducted. Alvarez (2015) research on Spanish secondary teachers found them to be confident in their information literacy abilities, for finding information but not as skilled at evaluating information. This investigation found teachers to be confident in searching, with several participants demonstrating strong skills in evaluation. However, it is difficult to assess teachers' information literacy abilities, as this data is based on participants self-reflection which may be biased or inaccurate.

Participants either directly discussed the issue of teaching other curriculum areas, or it was evidenced through their description of the various subjects they teach. Although they did not discuss the use of transferable teaching skills to assist them in teaching other subject areas, this is an educated assumption which can be made. Kereluik and Mishra's (2013) research has demonstrated the need for teachers to synthesise information and transfer it to different contexts. Due to the participants being confident that they are information literate, they will be practicing the synthesising of information and using it in the different lessons that they teach.

Overall, participants demonstrated a basic understanding of information literacy and its importance as a 21st century skill. The results mainly agreed with previous research into teachers' understanding of information literacy.

5.2 CPD

The results of this research did not fully align with results from similar studies. Some of the teachers and particularly the DHT felt that workshop event which heavily focused on the sharing of best practice to not always be beneficial. The DHT complained of CPD workshop events where the main activity was sharing best practice, as sometimes it felt like he was not learning anything new. He joked about feeling like a focus group, where the company organising the workshop would take the teachers discussions and use it for future workshops. Some participants expressed the desire for receiving guidance and wanted more than discussion groups. Although it is not believed that the participants would want to be in passive roles for their learning and development, the results cannot be concluded as agreeing with Burbank and Kauchak's research which considered collaborative approaches as being very effective (2003).

Similarly, Tafael and Fischer's research concluded that teachers particularly benefit from learning conversations with their colleagues as part of their CPD (2001). However, participants in this research did not discuss learning conversations as one of their main forms of CPD. In fact, the Technology teacher argued they were not part of his CPD, although he did spend time discussing issues relating to his teaching practice with colleagues and sharing advice and ideas with each other.

Despite some differences in results from this investigation and other research, teachers all expressed the importance of their CPD being tailored to their specific developmental needs. Geldenhuys and

Oosthuizen's (2015) research supports the argument formed by participants in this investigation, that CPD must be relevant to their development needs otherwise, it becomes a fruitless exercise.

6. Conclusion

The investigation found that although teachers were unfamiliar with the term information literacy, they recognised its importance and considered it as something which they taught to their pupils. Teachers demonstrated a basic understanding of information literacy and could consider skills associated with it which are needed for education and everyday life.

From this research, it can be concluded from the data gathered, that teachers felt confident in being information literate and that their information literacy had been developed during their time as students at university. They were confident in their abilities to search for information, with some demonstrating skills in evaluation. They were also aware of current issues in information literacy, such as fake news and considered this important for ensuring pupils learn to evaluate sources of information. All discussed a mistrust of Wikipedia, considering the online encyclopaedia to be unreliable, and actively discouraged pupils from not using it. However, none mentioned the possibility of using the references provided by Wikipedia articles to check if the information was reliable. This demonstrates the missed opportunity to teach pupils more advanced information literacy skills, such as checking the reliability of information by examining the sources references.

Due to participants confidence in their information literacy, they did not feel they would require support or further opportunities through CPD to develop their information literacy. Although the participants were receptive to the suggestion of teachers receiving support beyond their period of study at university, none were strongly in favour as they expressed the opinion that teachers should already be information literate, as they are required to teach these skills to pupils. They felt that all teachers would have to be sufficient in these skills in order to qualify as a teacher. There was some discussion from participants on their own research practices, with all believing they are sufficient in this area and some demonstrating evaluation thought processes.

However, none of the participants considered the possibility of developing their information literacy through other forms of CPD, beyond that of a taught workshop. They all claimed to have no support or guidance available to them on how to improve their information literacy. Overall, participants were reluctant to discuss informal CPD and were not as confident in their assertion that all the examples of informal CPD were as valued. Although aspects of informal CPD such as learning conversations, collaboration with colleagues and research assists teachers' development of information literacy, it was apparent that teachers did not recognise this connection. Their preference for workshops and organised events was strongly felt from the interviews.

It is therefore difficult to ascertain the extent to which they were developing information literacy through their current CPD beyond discussion of non-having attending workshops on information literacy. Some teachers did not consider learning conversations with fellow teachers to count as CPD and reflection were also not discussed by any of the teachers. Due to participants uncertainty and disengagement with informal CPD practices, it is not possible to conclude fully on whether they are developing their information literacy through their CPD.

From this study it is suggested that CPD on information literacy could benefit teachers as long as it is connected to classroom practice and teachers can go away and link it to the area of the curriculum they teach. It would be important to also develop teachers' information literacy skills so that they can conduct their own research more effectively, being able to gather relevant and reliable information efficiently. Despite participants overall confidence in being information literate, the data gathered

demonstrates that further work can be undertaken to support teachers and to demonstrate how they can further improve their information literacy.

6.1 Limitations of the study

There were several limitations of this study and methods of improving the quality of the data gathered. The number of participants ideally should have been higher and the opportunity for follow-up interviews to examine answers in more depth and detail would have produced more accurate and in-depth findings. Further examples of teachers CPD practices and examples of research they undertake would have resulted in the collection of more reliable data. Due to participants disengagement with informal CPD, some results are inconclusive. Although participants were directly asked about informal CPD, with examples given, discussion focussed heavily on workshops and events.

The methodology chosen was arguably not the preferred for this type of research, as phenomenography would have resulted in more accurate and detailed results. Such as the Phenomenography approach as carried out by Mark Forster in his research on nurses' information literacy, would be beneficial in helping to further understand the different type of personas teachers have in relation to information literacy (Inskip and Donaldson 2019). Closer examination of exact word choice would create a very detailed analysis of participants understanding of information literacy.

6.1 Recommendations

The recommendations for further research into secondary teachers' information literacy and CPD practices would be to cover a larger geographic area of Scotland with the use of a survey, as well as carrying out interviews or a case study. Also, to gather teachers' understanding of information literacy in the separate contexts of their work and personal lives. Discovering if they differ depending on whether they are discussing information literacy within education or within everyday life.

7. References

ABDI, E.S. and BRUCE, C., 2015. From workplace to profession: New focus for the information literacy discourse. *European Conference on Information Literacy,* pp. 59-69.

ÁLVAREZ, J., 2015. Information Literacy Grade of Secondary School Teachers in Spain-Beliefs and Self-Perceptions (English edition), 23(45), pp. 187-194.

ANDRETTA, S., 2012. *Ways of experiencing information literacy: Making the case for a relational approach.* Oxford: Chandos Publishing.

ARMSTRONG, C. et al., 2005. Defining information literacy for the UK. *Library & Information Update,* 4(1-2), pp. 22-25.

ATL, 2016. *CPD How to access it and why it's essential.* [online]. Available from: https://www.atl.org.uk/Images/worklife_campaign_cpd_factsheet.pdf [Accessed 11 October 2018].

BARTER, C. and RENOLD, E., 1999. The Use of Vignettes in Qualitative Research. *Social Research Update.* [online] Available from: http://sru.soc.surrey.ac.uk/SRU25.html [Accessed 7 May 2018].

BAWDEN, D., & ROBINSON, L., 2009. The dark side of information: Overload, anxiety and other paradoxes and pathologies. Journal of Information Science, 35(2), pp.180-191.

BLACK, C. et al., 2016. *Evaluation of the Impact of the Implementation of Teaching Scotland's Future.* [online]. Available from: https://www.gov.scot/publications/evaluation-impact-implementation-teaching-scotlands-future/pages/9/ [Accessed 22 July 2018].

BREIVIK, P.S.,1998., *Student Learning in the Information Age,* Pheonix: Oryx Press.

BRUCE, C.,2004. Information Literacy as a Catalyst for Educational Change. A Background Paper. In DANAHER, P.A., Eds. Proceedings Lifelong Learning: Whose responsibility and what is your contribution? *the 3rd International Lifelong Learning Conference*, Yeppoon, Queensland, pp. 8-19.

BURBANK, M.D. and KAUCHAK, D., 2003. An alternative model for professional development: Investigations into effective collaboration. *Teaching and teacher education,* 19(5), pp. 499-514.

CAENA, F., 2011. Literature review Quality in Teachers' continuing professional development. *Education and training,* 2020, pp. 2-20.

COCHRAN-SMITH, M. and LYTLE, S.L., 1993. *Inside outside: Teacher research and knowledge*, New York: Teachers College Press.
CROUSE, W. and KASBOHM, K.E., 2005. Information Literacy in Teacher Education: A Collaborative Model, The Educational Forum, 69(1), pp.44-52.

DAVIS-KAHL, S. and PAYNE, L., 2003. Teaching, learning and research: linking high school teachers to information literacy. *Reference Services Review,* 31(4), pp. 313-319.

DUKE, T.S. and WARD, J.D., 2009. Preparing information literate teachers: A metasynthesis. *Library & Information Science Research,* 31(4), pp. 247-256.
FOREHAND, M., 2010. Bloom's taxonomy. *Emerging perspectives on learning, teaching, and technology*, 41(4), pp.47-56.

GELDENHUYS, J.L. and OOSTHUIZEN, L.C., 2015. Challenges influencing teachers' involvement in continuous professional development: A South African perspective. *Teaching and teacher education,* 51, pp. 203-212.

GILTIN, A.; BARLOW, L. & BURBANK, M. 1999. Preservice teacher' thinking on research: Implications for inquiry orientated teacher education. Teaching and Teacher Education, 15 (7), 753-769.

GULSTON, K., 2010. *The challenges experienced by educators in primary schools regarding continuous professional development*. [online]. Available from: https://repository.up.ac.za/bitstream/handle/2263/28302/dissertation.pdf?sequence=1&isAllowed=y [Accessed 2 March 2019].

GOROZIDIS, G. and PAPAIOANNOU, A.G., 2014. Teachers' motivation to participate in training and to implement innovations. *Teaching and Teacher Education*, 39, pp.1-11.

HUSTLER, D., MCNAMARA, O. and JARVIS, J. et al., 2003. *Teachers' Perceptions of Continuing Professional Development,* Manchester: Manchester Metropolitan University.

INKSIP, C. & DONALSON, S., 2019. On the move: getting from higher education to work. Information Professional, April 2018. pp.37-40.

KERELUIK, K. et al. (2013) What Knowledge Is of Most Worth, *Journal of Digital Learning in Teacher Education,* 29(4), pp.127-140.

KLEBANSKY, A. and FRASER, S., 2013. A strategic approach to curriculum design for information literacy in teacher education–Implementing an information literacy conceptual framework. *Australian Journal of Teacher Education,* 38(11), pp. 103-125.

KYNDT, E. et al., 2016. Teachers' everyday professional development: Mapping informal learning activities, antecedents, and learning outcomes. *Review of educational research,* 86(4), pp. 1111-1150.

KIRSCHNER, P.A., SWELLER, J. and CLARK, R.E., 2006. Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational psychologist,* 41(2), pp. 75-86.

LLOYD, A., 2005. Information literacy: different contexts, different concepts, different truths? *Journal of Librarianship and information Science,* 37(2), pp. 82-88.

LLOYD, A. and WILLIAMSON, K., 2008. Towards an understanding of information literacy in context: Implications for research. *Journal of Librarianship and information Science,* 40(1), pp. 3-12.

LLOYD, A., 2011. From Skills to Practice: How Does Information Literacy Happen? *Journal of the Korean Society for Library and Information Science,* 45(2), pp. 41-60.

LLOYD, A., 2013. Building information resilient workers: the critical ground of workplace information literacy. What have we learnt? *European Conference on Information Literacy* 2013, Springer, pp. 219-228.

MACIÀ, M. and GARCÍA, I., 2016. Informal online communities and networks as a source of teacher professional development: A review. *Teaching and Teacher Education,* 55, pp. 291-307.

MARCUM, J.W., 2002. Rethinking information literacy. *The Library Quarterly,* 72(1), pp. 1-26.

MARTZOUKOU, K. and SAYYAD ABDI, E., 2017. Towards an everyday life information literacy mind-set: a review of literature. *Journal of documentation,* 73(4), pp. 634-665.

PROBERT, E., 2009. Information literacy skills: teacher understandings and practice. *Computers & Education,* 53(1), pp.24-33.

ROCKMAN, I.F., 2002. *Strengthening connections between information literacy, general education, and assessment efforts.* [online]. Available from: https://www.ideals.illinois.edu/bitstream/handle/2142/8465/librarytrendsv51i2e_opt.pdf?sequence=1 [Accessed 2 March 2019].

SCOTTISH EXECUTIVE, undated. *A Curriculum for Excellence: Experiences and Outcomes.* [online]. Available from: file:///E:/Dissertation/Curriculum/all%20experiences%20and%20outcomes.pdf [Accessed 10 February 2019].

SCOTTISH EXECUTIVE, 2003. *Continuing Professional Development*. [online]. Available from: https://www.gov.scot/Resource/Doc/47021/0023973.pdf (webarchive.org.uk) [Accessed 1 April 2019].

SCOTTISH EXECUTIVE, 2006. *A Curriculum for Excellence: Building the Curriculum 1.* [online]. Available from: https://education.gov.scot/Documents/btc1.pdf [Accessed 9 May 2018].

SCOTTISH EXECUTIVE, 2010a. *A Curriculum for Excellence: Building the Curriculum 1.* [online]. Available from: file:///E:/Dissertation/Curriculum/building%20the%20curriculum%201.pdf [Accessed 6 March 2019].

SCOTTISH EXECUTIVE, 2010b. *A Curriculum for Excellence: Building the Curriculum 2.* [online]. Available from: file:///E:/Dissertation/Curriculum/building%20the%20curriculum%202.pdf [Accessed 6 March 2019].

SCOTTISH EXECUTIVE, 2008. *A Curriculum for Excellence: Building the Curriculum 3.* [online]. Available from: file:///E:/Dissertation/Curriculum/building%20the%20curriculum%203.pdf [Accessed 6 March 2019].

SCOTTISH EXECUTIVE, 2009. *A Curriculum for Excellence: Building the Curriculum 4.* [online]. Available from: file:///E:/Dissertation/Curriculum/Building%20the%20curriculum%204.pdf [Accessed 6 March 2019].

SHENTON, A. K., and FITZGIBBONS, M., 2010. Making information literacy relevant. *Library Review*, 59(3), pp. 165-174.

SMITH, J.K., 2013. Secondary teachers and information literacy (IL): Teacher understanding and perceptions of IL in the classroom. *Library & Information Science Research,* 35(3), pp.216-222.

TRANSCRIBE, undated. Transcribe Software. [online]. Available from: https://transcribe.wreally.com/login [Accessed 10 October 2018].

WENGER, E., 2010. Communities of practice and social learning systems: the career of a concept. *Social learning systems and communities of practice.* Springer, pp. 179-198.

WILLIAMS, D. and COLES, L., 2007. Evidence-based practice in teaching: an information perspective. *Journal of Documentation,* 63(6), pp. 812-835.

WILLIAMS, D. and WAVELL, C., 2006. *Information literacy in the classroom: Secondary school teachers' conceptions.* [online]. Available from: https://openair.rgu.ac.uk/bitstream/handle/10059/42/SESfinalreportPDF17_07_06.pdf?sequence=1&isAllowed=y [Accessed 16 February 2019].

8. Bibliography

BREIVIK, P.S., 2005. 21st century learning and information literacy. *Change: The Magazine of Higher Learning,* 37(2), pp. 21-27.

COONAN, E., 2011. *A New Curriculum for Information Literacy (ANCIL)-Teaching learning: perceptions of information literacy*. [online]. Available from: https://www.repository.cam.ac.uk/bitstream/handle/1810/244637/theory.pdf?sequence=1&isAllowed=y [Accessed 2 March 2019].

EVERS, A.T., et al., 2016. Organisational and task factors influencing teachers' professional development at work. *European Journal of Training and Development,* 40(1), pp. 36-55.

GTCS, undated Professional Update, [online]. Available from: https://www.gtcs.org.uk/professional-update/professional-update.aspx [Accessed 5 April 2019].

HARDING, J., 2013., *Qualitative Data Analysis from start to finish.* London: Sage Publications Ltd.

HEAD, A.J., HOECK, M.V. and ESCHLER, J., et al., 2013. What information competencies matter in today's workplace? 2013. *Library and information research,* 37(114), pp. 74-104.

INSKIP, C., 2014. Information literacy is for life, not just for a good degree: a literature review. [online]. Available from: http://discovery.ucl.ac.uk/1448073/1/IL%20in%20the%20workplace%20literature%20review%20Dr%20C%20Inskip%20June%202014.%20doc.pdf [Accessed 10 November 2018].

JULIEN, H. and BARKER, S., 2009. How high-school students find and evaluate scientific information: A basis for information literacy skills development. *Library & Information Science Research,* 31(1), pp. 12-17.

KOVALIK, C.L., et al., 2010. Information literacy, collaboration, and teacher education. *Communications in Information Literacy,* 4(2), pp. 145.

KUMAR, R., 1996. *Research Methodology a step-by-step guide for beginners.* London: Sage Publications.

KVALE, S. and BRINKMAN, S., 2009. *Interviews: Learning the craft if qualitative research interviewing.* California: Sage Publications.

KWAKMAN, K. 2001, Work stress and work-based learning in secondary education: testing the Karasek model, *Human Resource Development International*, 4(4), pp. 487-501.

LEE, I., 2008, Understanding teachers' written feedback practices in Hong Kong secondary classrooms, *Journal of Second Language Writing*, 17 (2) pp. 69-85.

LIU, D. and FU, P.P., 2011, Motivating proteges' personal learning in teams: a multilevel investigation of autonomy support and autonomy orientation, *Journal of Applied Psychology* , 96 (6) pp. 1195-1208.

LLOYD, A., 2005. No man (or woman) is an island: information literacy, affordances and communities of practice. *The Australian Library Journal,* 54(3), pp. 230-237.

MERTES, N., 2014. Teachers' conceptions of student information literacy learning and teachers' practices of information literacy teaching and collaboration with the school library. [online]. Available from: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.630.1360&rep=rep1&type=pdf [Accessed 14 January 2019].

OWUSU-ANSAH, E.K., 2005. Debating definitions of information literacy: enough is enough! *Library Review,* 54(6), pp. 366-374.

POSTHOM, M.B. 2012, Teachers' professional development: a theoretical review, *Educational Research*, 54(4), pp. 405-429.

SCOTTISH EXECUTIVE, 2011. *A Curriculum for Excellence: Building the Curriculum 5.* [online]. Available from: file:///E:/Dissertation/Curriculum/building%20the%20curriculum%205.pdf [Accessed 6 March 2019].

SCOTTISH EXECUTIVE, 2017. *Benchmarks First Level.* [online]. Available from: file:///E:/Dissertation/Curriculum/FirstLevelBenchmarksAllAreasPDF.pdf [Accessed 10 February 2019].

SCOTTISH EXECUTIVE, 2017. *Benchmarks Second Level.* [online]. Available from: file:///E:/Dissertation/Curriculum/SecondLevelBenchmarksAllAreasPDF.pdf [Accessed 10 February 2019].

SCHROEDER, R. & CAHOY, E. S.,2010. Valuing Information Literacy: Affective Learning and the ACRL Standards. portal: Libraries and the Academy 10(2), pp. 127-146.

YU, H., ABRIZAH, A. and SANI, MAD KHIR JOHARI ABDULLAH, 2016. Information literacy through resource-based learning: Malaysian teachers' conception and instructional practices. *Malaysian Journal of Library & Information Science,* 21(1), pp. 53-67.

Acknowledgements