

Am I building a bubble around me? A phenomenographic study exploring students' perceptions of online personalised filters and information literacy.

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Abstract

For networked learning to be successful, students need good information literacy skills. These skills will enable them to move away from being "passive recipients of digitally distributed information" (Wiske, 2011) to become critical thinkers willing to challenge, discuss, collaborate and connect with other learners and teachers. This small-scale study uses phenomenography to investigate students' perceptions and experiences of personalised filters, which present a challenge for educators concerned with developing information literacy skills. Findings show that students are comfortable with filters to find basic information. However, for more complex ideas, students felt they needed to adopt sophisticated search strategies.

Keywords

Personalised filters; information literacy, phenomenography

Introduction

Networked Learning is defined by the Centre for Studies in Advanced Learning Technology (CSALT) as "learning in which C&IT is used to promote connections : between one learner and other learners, between learners and tutors; between a learning community and its learning resources" (CSALT, 2004). However, in order for students to be able to connect knowledgeably and for networked learning to be successful, students' technical and information literacy (IL) skills need to be sufficiently well developed (Kirkwood, 2006). This paper is concerned with investigating students' information literacy skills in the context of the ever-increasing amount of information that is available online and the requirement for students to become active learners, able to access, evaluate (Williamson et al., 2007) and challenge the sources of this information.

Head & Eisenberg (2009) and Komissarov & Murray (2016) found that Google and Wikipedia were the most frequently used sources by students. Yet, while students may often be given instruction on the reliability of sources in IL training, they may not be made aware of personalisation filters and how these can affect the information that is presented to them on search engines, such as Google. Supporters of personalisation argue that it enhances the user experience, while opponents such as Eli Pariser (2011) have claimed that extensive personalisation can lead to the creation of a filter bubble, where users are presented with information that confirms their perspective and contrasting views are withheld.

Purpose of this study

The purpose of this small-scale study is to examine a group of college students' experience and perceptions of personalised filters and how these might impact their information literacy. This research was conducted in a teaching-intensive higher education institute, where students are expected to have high levels of IL, yet no formal training is provided.

The research focuses on identifying the variation in these perceptions from the students' accounts of their experiences. The sub-questions below help to inform the study:

1. Is there variance in the reaction of students to the use of personalised filters?
2. What are the various ways in which students may have experienced personalised filters?
3. How do they perceive these personalised filters will impact their information literacy?

Literature review

The following section provides a brief overview of literature relating to issues that surround personalised filters in the context of this study.

Personalised Search

Personalisation is “the process of presenting the right information to the right user at the right moment” (Speretta & Gauch, 2005, p. 2). The concept of personalised online searches is not a new one, accompanying the introduction of the search engine in the late 1990s. Pretschner and Gauch (1999) wrote about ontology-based personalised searches, focusing on how “profiles [could] be used to achieve search performance improvements” (p.391). Chen & Kuo (2000) proposed a “personalised information retrieval system based on a user profile” (p.4), recognising that without this, the degree of relevancy of search results may be disproportionate to what the user had expected (p.3). Pitkow et al. (2002) also underlined the need for personal relevancy when a user conducts an online search, identifying both contextualization and individualization as key elements in achieving personal relevancy.

Qiu & Cho (2006) suggested that personalised searches could improve the user experience by presenting users with information, resources, services and products most compatible with their perceived preferences, simply identified by algorithmic search results (Venugopal et al, 2009). Others such as Xu et al. (2008) and Garofalakis et al. (2005) highlighted the amount of time a user could save through personalisation and the provision of relevant results, attempting to overcome the challenges of the attention crash (Pariser, 2011). As more and more users identified the web as their main source for information, personalisation became a way to sift through the masses of information available online.

Although many of the more popular search engines such as Yahoo and Bing introduced personalised searches for its users around the same time as Google, this study concentrates on Google specifically, since it pioneered personalised search in 2005 for its signed-in users, informing them that it would be able to provide users with more relevant search results, as their search history grew.

In 2009 Google introduced personalised search for signed-out users also, explaining that they would be able to customize search results based on “180 days of search activity linked to an anonymous cookie in [the] browser” (Horling & Matthew, 2009). Through the process of learning about a user’s past history, based on their previous click history, user interests could be identified and used to rank pages that would be of specific relevance to the user (Qiu & Cho, 2006). The content analysis of a user’s visited pages could also be used to gauge user interest. However, alongside the race to develop the most sophisticated web search engine, there were numerous discussions about the privacy concerns that personalisation needed to address, some of which are highlighted below.

Privacy concerns

Riedl (2001) presented personalisation as a double-edged sword. On the one hand, it allowed users to benefit from recommender systems, which could help them filter the mass of online information. On the other, these recommender tools could be used to invade users’ privacy. Awad & Krishnan (2006) conducted secondary data analysis of a survey on 400 online users to establish if there was a willingness amongst users to be profiled for personalisation, and found that there were concerns about privacy. Nissenbaum (2011) published a comprehensive report on the intricacies of protecting privacy online, identifying the many ways that privacy can be breached, such as “data gathering, dissemination, aggregation, analysis, and profiling [of users]” (p.34). As the debate over personalisation versus privacy continued, another discussion emerged - the effect that personalisation had on how we acquire and store information. This research study has been informed by the book *The Filter Bubble* (Pariser, 2011) which deals with this issue comprehensively.

While the previous authors cited were concerned about the storing of an individual’s information, Pariser points to the danger associated with personalisation in the context of learning and creativity. He noted that personalisation was creating a “unique universe of information for each of us” (p. 9). More recently, Spohr (2017) points to an 'ideological polarization' because of this filter bubble. However, the objective of the search engine (Google in this case) was to “build a theory of identity” (p. 34) for each user, in order to produce a relevant list of results for that user. Pariser argued that this insidious filtering out of information was limiting “what we [were] exposed to and [could] therefore affect the way we think and learn” (p. 83). If the results of an Internet search were based on previous search history, or a combination of any or all of the data signals stored by Google, Pariser reasoned that users were at risk of confirmation bias, only “consuming information that conforms to [their] ideas of the world”(p. 88), confirming their ideological beliefs, without being challenged. Gentzkow & Shapiro (2011) shared Pariser’s concerns, referring to the importance of exposing individuals to viewpoints that often contradict their pre-existing views, while Vallet & Castells (2011) suggested that the combination of diversification and personalisation factors could potentially overcome some of the concerns about the intrusive nature of the personalised search.

While the debate about privacy concerns continued, another debate began about the emergence of digital learners. The following section deals with some of the elements in this debate to provide context for this study.

A New Generation of Learners

As search engine algorithms increased in complexity and the web continued to provide opportunities for a rich user experience, the new wave of "digital learners" (Brown, 2000) was expected to navigate the “complex information spaces” (p.14) better than the non-digital adults. Hahn & Puybaraud (2012) also asserted that these

students were skilled in filtering the large amounts of information they were confronted with. Yet, their knowledge of personalisation is often limited, as highlighted by Powers (2017) in a study of college students on news personalisation.

However, there has been much debate about the emergence of a digital generation. Buckingham (2006) challenged the notion of a “Net-Generation”, a term coined by Tapscott (1998), arguing that technological change can affect every generation, depending on how it is used. Bennett & Maton (2010) suggest that the debate about digital natives (Prensky, 2001) has particular relevance for the education sector, proposing that students may not be as skilled with technology as assumed, while others contend that this generation of students is not a homogenous one, and that they display much variation in how they engage with technology for learning Jones et al. (2010).

Margaryan et al. (2011) found that students from different disciplines had different relationships with technology and how they used it for learning. Additionally, different teaching approaches, for example problem- and project-based learning, require students to critically select information and "let the information contribute to their construction of knowledge within the group" (Nielsen & Andreasen, 2013, p. 12), underlining the importance of IL skills in the context of networked learning in a digital era.

Information literacy in the digital age

The American Library Association (1989) defines IL as a set of skills called upon to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information". SCONUL (2011) states that information literacy “encompasses concepts such as digital, visual and media literacies, academic literacy, information handling, information skills, data curation and data management” (p.3).

The growth of the Internet increased accessibility to information and a number of research studies focused on the information literacy of the students who used this new medium. A report by Head & Eisenberg (2009) examined how students accessed information in this digital age, and found that over 90% of the 2,318 college students surveyed accessed Google and Wikipedia to research everyday topics. In 2010, a comparative study was carried out by Head & Eisenberg with a total of 8353 students and results indicated that “students intentionally [made] use of a small compass for traversing the ever-widening and complex information landscape they inhabit, whether they are finding information for course work or for use in their daily lives” (ibid, p.36). In terms of evaluating the information they found, students had devised strategies for identifying what they considered useful such as how current the information was, the design of the site and how familiar they were with the site (ibid, p.36). However, while this provides valuable insight into what it is like to be a student in a digital world, it does not drill down to the level of the search results carried out by the students, to identify whether students are aware that these search results may be influenced by personalisation.

Powers (2017), on the other hand, interviewed 37 college students at one American university (Study 1) and surveyed 147 at another American HE institute (Study 2) to ascertain how aware they were of editorial judgements as a result of their search terms. The majority of students in Study 1 were aware that data was gathered, but not that this led to changes in news selection. In Study 2, only one participant used the term 'personalisation', with only 23% of participants indicating that they knew editorial choices could be made based on their searches. Interestingly, none of the students in either study referred to strategies for circumventing personalisation, such as those highlighted by Bozdag & van den Hoven (2015).

It is in this context that the present small-scale research study contributes to the discussion on the impact of personalisation filters on information literacy in a higher education setting.

Methodology

Since this study focuses on the variations in students’ experiences of personalised filters and the impact on information literacy, phenomenography was chosen as the most suitable approach. Additionally, phenomenography has been successfully used elsewhere in studies on information literacy, for example in research carried out by Andretta (2007) and Diehm & Lupton (2012).

Phenomenography takes a non-dualistic ontological perspective, noting that the subject and object (in this case the experience) cannot exist independently of each other. This second-order perspective, i.e. the focus is not on the phenomenon itself but how people experience the phenomenon, provides descriptions of how people experience “various aspects of the world” (Marton, 1981, p. 178).

Phenomenographic studies are designed to reveal variations in participant experiences, organising these variations into logically related categories, known as an outcome space (Trigwell, 2006). Each phenomenon, concept, or principle can be understood in a limited number of qualitatively different ways (Marton, 1986) and these ways of experiencing are considered the “unit of analysis” (Säljö, 1997, p.177).

The most common means of data collection is the semi-structured interview. However, while the research provides insights into the individual experience, it is most interested in results at a collective level (Booth,

2008). Booth (1997) also identified three distinct criteria for examining the quality of the outcome space. Each category should reveal something distinctive about the understanding of the phenomenon and be logically related to the other categories, in an outcome space that is most usually a hierarchy. Finally, variation should be represented in as few categories as possible.

Method

Participants

Four students were purposively selected from two programmes within the researcher's institute. While the small number of participants may not identify all the "qualitatively different ways" (Marton, 1981, p. 181) of experiencing personalised filters, this study could form the basis for a more extensive investigation of the phenomenon. Criterion sampling (Creswell, 2013) was used to identify students in Year 3 of their programme, with the assumption that they had sufficient knowledge and experience of the phenomenon being investigated (Olsen, 2011), i.e. online searches and personalisation. The students were chosen from a technology programme and a social care programme, so as to provide contrast. The aim here was to see if it made any difference whether students were online more frequently or not, in determining whether they were aware of personalised filters.

Data collection

Semi—structured interviews, lasting approximately 30 minutes, were used as the means of data collection to elicit the students' experiences of personalised filters. Initially, questions were devised to provide a semi-structured schedule to the interview, such as:

- Have you heard of the filter bubble or personalised searches before?
- Can you give me an example of an assignment where you would have to look online for information and talk me through the process of how you would do that?
- How did you decide that (the source of information) was reliable?
- Do you think relevance (personalisation) is a good thing?

Asking participants to complete an activity would be typical of a phenomenographic study (Reed, 2006). In this case the activity would introduce the topic and provide some context for the research study. Participants were invited to watch approximately four minutes from a Ted Talk by Eli Pariser (2011) at the beginning of the interview. The purpose of this was two-fold, students would have a common understanding of what the term 'personalised filter meant and the Ted Talk would act as a prompt for the qualitative interview questions, to explore their reaction to personalised filters.

Data analysis

The recorded interviews were transcribed verbatim and the data was collated in an Excel spreadsheet, organised by question and colour-coded for each participant. Ethical approval was granted for the study by the two institutions concerned and BERA (2011) guidelines were used to inform the process.

Using an inductive process (Dawson, 2009) the transcripts were analysed for common themes, with the researcher bracketing assumptions (Ashworth & Lucas, 1998) about the phenomenon in question. Bracketing is especially important in a phenomenographic study to reduce bias and allow the researcher to concentrate on the data (Tight, 2015). Initial readings of the transcripts concentrated on identifying commonality and differences, "decontextualizing and recontextualising" the data (Booth, 2008, p. 453) to attempt to identify responses to the research question. Subsequent readings attempted to put a structure around the unit of analysis, i.e. the various ways in which students perceived personalised filters, identifying categories that were different but were deemed to construct a hierarchy (Booth, 1997).

Results

The study revealed that students perceived personalised filters in different ways, depending on the context and the purpose of their online searches.

Following analysis of the interview transcripts, two qualitatively different ways were constituted. However, these views are not distinct for each participant, but rather they represent variation across the group. Students had little or no objection to personalised filters in simple online searches to find basic, introductory information or entertainment. However, students felt that personalised filters presented too narrow a viewpoint for more complex ideas or information.

Outcome space

Åkerlind (2005) advises that the phenomenographic researcher should aim to constitute not only a set of different meanings, but also a logical structure which relates the different meanings. The outcome space described in the table below shows the way in which the different categories fit into an overall description of how the phenomenon is experienced (Ashworth & Lucas, 1998).

Structural	Referential	
	Facilitates information retrieval	Limits information retrieval
Introductory information and entertainment	1	
Complex information and advanced disciplinary knowledge		2

Table 1: The referential and structural aspects of the outcome space

The categories may be presented as an inclusive hierarchy, with each category subsuming the category below. However, these need not be developmental, since students may not move from one category to the next as they learn more about the phenomenon in question (Ashwin, 2006). This point is particularly relevant in this study, since the outcome space displays the complexity of how the phenomenon is experienced (Diehm & Lupton, 2012) and identifies that students actually have opposing views on the use of personalised filters, depending on the purpose and scope of their search.

As displayed in Table 1, the structural aspects focus on what is in the foreground or background as students recount their experiences of personalised filters. The referential aspects focus on what the use of personalised filters mean for the students who participated in this study. Together, these elements form each category of description: under category 1 students understand that through the use of personalised filters they can access simple facts and entertainment much faster, whereas in category 2 students recognise that personalised filters may limit their access to information which would deepen their knowledge of a particular topic or subject area. At this point it is useful to set out each of the categories and focus on the data from the transcripts which provided a rationale for the creation of each of the categories.

Category 1: Students had little or no objection to personalised filters in simple online searches to find basic, introductory information or entertainment.

Students' accounts that were aligned to this category showed evidence of how students were initially quite shocked by the thought that search results were filtered and personalised to match their perceived needs. However, as the interview progressed, it emerged that they felt personalised filters had a role to play in dealing with the masses of information online, particularly if they needed access to the information quickly.

If it was just like a random personal search say if I was searching for Kardashian, you'd just throw their name in and they'd come up straight away, d'you know like TMZ [a celebrity news site] or something like that, like, [...] you wouldn't really care where it was coming from.

You know it's [content] filtered to my needs and that's exactly what I need this time or there's something relevant to that...

When asked if their new knowledge of the filter bubble would change how they looked for information online, some students admitted that it probably wouldn't affect their basic searches:

It won't affect the more shallow [sic] kinda searches, you know like the celebrity searches, or TV searches.

Category 2: Students felt that personalised filters presented too narrow a viewpoint for more complex ideas or information.

In the students' accounts aligned to this category there was consensus that if they were researching a topic on an important social issue, or looking to deepen their knowledge of a topic related to their academic discipline, they did not want the information to be filtered, i.e. they wanted to get a general understanding of all aspects of the topic they were researching.

... it's kind of reaffirming that your opinion is right, cos you're not seeing the other side of things.

It's kind of disturbing that I'm not getting the whole story when it's being tailored for me, I want to know all the other stuff as well.

This resistance to filtering also emerged when students were asked about other filters they had encountered offline:

I think that someone that sits down and solely watches the [...] news, no papers, just the news of the reporter, I think they're not broadening their minds with different perspectives on the one story. You got [...] all the different news channels, all legitimately backed stuff, it gives a different definition and perspective of the actual story.

It is worth noting that the excerpts selected above were representative of the range in the experience of the group, rather than the individual, which is the focus of analysis in phenomenography (Trigwell, 2006).

Discussion

In discussing the variation in students' perceptions of personalised filters and how these impact on their information literacy skills, it is useful to refer to the research sub questions highlighted at the beginning of the study:

- Is there variance in the reaction of students to the use of personalised filters?
- What are the various ways in which students may have experienced personalised filters?
- How do they perceive these personalised filters will impact their information literacy?

Firstly, students noted that personalised filters had a role to play in the context of helping them to gain access to basic information and entertainment more readily. This supports the claim by Qiu & Cho (2006) that it could significantly improve the user experience and the students in this study could see the value of having relevant results, filtered for them and displayed on the front page of a Google search.

However, it was noted in the study that students were uncomfortable with the idea that information was withheld from them (as they saw it), when the research topic was of a more serious nature or if they wanted to deepen their knowledge of a discipline area. Their responses reflected a level of maturity, perhaps linked to the fact that they were in Year 3 of their respective programmes. It was quite important for them to have access to the whole story, rather than reaffirming that their opinion is the correct one, with some participants reflecting the view of Gentzkow & Shapiro (2011) who state that individuals should be exposed to differing viewpoints. Students identified the danger associated with the filter bubble, in particular the confirmation bias referred to by Pariser (2011).

Secondly, a lack of awareness of personalised filters underpinned both categories of description identified, as students revealed that they were only vaguely aware or not at all aware of personalisation and did not identify it as a filter that was being applied based on their search history or the other signals, as outlined by Horling & Matthew (2009). This is relevant in the context of the comment by Bennett & Maton, (2010) that students may not be as skilled with technology as assumed.

Finally, students agreed that personalised filters had significant implications for their information literacy. If, as they indicated during the study, they do not progress past the first page of Google, there is a clear need to develop their information literacy skills to identify what a reliable or credible source is and learn to navigate the mass of information available to them online, a point highlighted by Head & Eisenberg (2010).

Conclusion

This research study set out to identify the variation in students' perceptions of personalised filters using a phenomenographic approach. The study was situated in the context of the importance of information literacy skills for a networked learning environment. The outcome space represents this variation as extrapolated from the students' accounts of their experiences of online searches and shows two categories of conceptions of personalised filters. The context and scope of online searches were important, and the categories outlined students' views of personalised filters in differing contexts.

This study also showed that although students had developed strategies to help them conduct their online searches, when it came to personalised filters, there was a deficit in their knowledge, similar to Powers (2017), regardless of whether they were technology students or not. The literature review showed a chronological

development of personalised filters and the issues surrounding these, from privacy concerns to the filter bubble of information created as a result of extensive personalisation. Given the lack of awareness surrounding personalised filters, it would be useful for students to receive formal instruction about personalised filters as part of their information literacy education. For reference, the Consortium of National and University Libraries (CONUL, 2011) in Ireland has published a guideline document about the integration of information awareness of personalisation filters.

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