Personal information management practices of students and its implications for library services

Francis Osae Otopah and Perpetua Dadzie
Department of Information Studies, University of Ghana, Accra, Ghana

Abstract

Purpose – The aim of this study is to investigate the personal information management (PIM) practices of students and its implications for library services at the University of Ghana.

Design/methodology/approach – This was a survey research, and questionnaires were administered to 150 students across their various programs of study. Questionnaire design was based on the literature reviewed and research objectives.

Findings – Results showed that, format, skills, size of collection, memory, and habits accounted for diverse PIM practices among students. Among the major drawbacks were inadequate skills, information fragmentation, inappropriate habits, and imperfect memory. These aspects when improved, would enhance the effectiveness of students' PIM practices tremendously.

Research limitations/implications – The study adopted the PIM framework developed by James and Teevan and focused on the core activities of PIM namely: keeping, organizing and re-finding. In order to provide a fair rounded picture of the PIM situation of students, it is expected that subsequent studies would cover the remaining variables notably- information maintenance; selection and implementation of a scheme; managing privacy and the flow of information; matters of security; measurement and evaluation; and making sense of things.

Practical implications – The study concludes that, through comprehensive information literacy training programmes offered by libraries; student-oriented PIM researches; the formation of PIM clubs spearheaded by librarians and supported by university administrators, benevolent organizations and individuals, the PIM practices of students can be made better. PIM efforts should aim at shaping, improving, integrating and supporting students' PIM habits, skills, personal information collections and memories respectively.

Originality/value – PIM practices of students is among the least explored topics in the field of library and information studies in Ghana. This research would not only create awareness about PIM practices, but would also draw attention to the efforts that can be made to improve PIM practices of students in Ghana.

Keywords Personal information management (PIM) practices, University students, University of Ghana, Information literacy, Implications for library services, Libraries, Students, Information management, Ghana

Paper type Research paper

Introduction

> We depend on information to understand the world, to get things done, to make good decisions, to learn and gain better mastery of the world, to understand what we can affect, and what we must learn to live with (Jones, 2008).

This makes it necessary to consciously manage information in such ways as would ease the access and use of it. Because of the spate of information explosion in the present era (Jones, 2008; Bruce, 2005), one encounters so much information at times that one actually does not need it, and one does not always find the right information in

Aslib Proceedings: New Information Perspectives
Vol. 65 No. 2, 2013
pp. 143-160

0001-253X
DOI 10.1108/00012531311313970

time when one needs it. This calls for a more critical approach to information and its management, at both organisational and individual levels. At the library level, the need for information literacy skills has been recognised as the latter provides the set of abilities that enable individuals to locate, evaluate and use effectively the needed information (ACRL, 2000).

Most organisations of today are setting up more information management units in order to ensure that the right information is made available to support the activities and interests of the right users when necessary, and also to facilitate the accomplishment of organisational competitive and strategic objectives. Similarly, students also manage personal collections of information in order to support their academic activities and other objectives. As students learn, they deal with so much information from various sources and formats, which they use for their academic work and other activities (Hardof-Jaffe *et al.*, 2009). They often obtain information from libraries, the internet colleagues and others. In addition, they also create a lot of information resulting from their assignments, presentations, articles and several others. These activities, coupled with the information age, often leave students exposed to so much information than they need. Driven by the fact that they would need to use the information again in their short term or long term activities and decisions, students need to keep some of these information items they encounter. This leads to the creation of personal information collections, which sometimes happens unconsciously. As a matter of fact, students often add and also retrieve information from these collections on a daily basis. Therefore, it has become vital for them to be equipped with the right attitudes, appropriate skills and tools to be able to effectively and efficiently create and manage their personal information collections. This way, they would be able to effectively manage and conveniently find useful information from their own personal collections to pursue any objectives they wish to achieve. They would also be saved from the "too much information syndrome" of today's information society which often obstructs them from finding the relevant information they need.

Generally speaking, all the information items an individual encounters and keeps in his/her personal information space constitute his/her personal information, and the range of activities an individual performs in order to acquire, keep, organize, maintain and retrieve information from his/her personal information collection (PIC) for everyday use, is termed personal information management (Jones, 2008). PIM is integral to the learning process (Bergman *et al.*, 2007) and students regularly perform it. It also involves a wide range of activities (Jones, 2008), but as Civan *et al.* (2008) state, keeping, organising and re-finding are the activities that are basic to personal information management. This study therefore investigated students' PIM practices in terms of these three activities, namely, keeping, organising and re-finding. Both paper and non-paper based formats were considered, as University of Ghana students deal with documents in all these formats.

Several PIM tools now exist for the management of documents in electronic formats. While new devices are produced and added on a daily basis, existing ones are also being improved rapidly. Recent international trade co-operations have also facilitated the dumping of large quantities of second-hand, shoddy, and cheap ICT products on the Ghanaian market (Ndzibah, 2009), leading to the proliferation of PIM tools in Ghana. Furthermore, the springing up of several computer training centres in Ghana (Fontaine, 2000; Martey, 2004), and the strong emphasis on user-friendliness and

ease-of-use in the ICT industry, have also enhanced the ability of students to use PIM tools more than ever. But have these situations satisfactorily led to the Ghanaian student's ownership and abilities to utilize the available PIM tools to better perform their PIM practices? Better PIM practices would benefit students immensely, as it ensures that, one always has the right information in the right place, in the right form, and of sufficient completeness and quality to meet one's current need (Jones and Bruce, 2005). Therefore, this study seeks to investigate the PIM practices of students and also examine its implications for library services.

The subsequent sections that follow are the literature review, followed by theoretical framework, research design, presentation and discussion of results in the context of the literature. Research limitations, conclusions and implications of findings for library services are the last themes that complete the work.

Literature review

Several studies have looked into personal information management (PIM) practices in various situations. Keeping, organising and re-finding practices have remained central to most of these studies. The areas of focus usually include the factors that influence the adoption of certain PIM strategies, challenges of PIM practices, the effects of PIM practices on the individual, as well as what librarians can do to help improve PIM practices of students.

The retention of information for later access and use is known as keeping (Bruce, 2005; Jones, 2008). Bruce (2005) is one of the authors who wrote extensively about the keeping activity. He sees keeping as one of the key activities of PIM. Jones (2008) concurs that keeping involves the assessment of the usefulness of an information item before deciding to retain it or not. Bruce (2005) adds to Jones' (2008) view by stating that, individuals keep information when they consider that it would be useful at a future time. Boardman and Sasse (2004) discovered that, people keep information because they need it "to do their work"; "to be reminded of their commitments", "to share with others", and "just in case they need them later". Jones *et al.* (2004) summed it all by stating that, given the significant role information plays in an individual's daily life, there is the need to always take charge of information that is deemed useful. In their study, Jones *et al.* (2004) observed e-mail to self; e-mail to others; print out the web page; save the web page as a file; make a bookmark or favourite; write on paper and others as some of the keeping methods that are employed by web users. Mansourian (2008) also brought to light, writing in printed notebooks, typing in electronic documents; and recording on tape. The use of places such as file folders, shelves, cabinets, drawers and tables to keep paper based documents, has also been revealed in many scholarly investigations (Thomson, 2009; Barreau, 2009).

Because information is kept for future use, it needs to be managed in such a way that, it can be found again when needed. According to Jones *et al.* (2004), this is where organising comes in. Organising involves placing, renaming, moving, creating folders, labelling and classifying information items in such a manner as would yield their retrieval (Boardman, 2004). Teevan *et al.* (2006) found that, individuals organize their personal information because they want to support serendipitous browsing; boost their confidence; and also gain satisfaction for having put their things in order. Many different strategies for organising have been observed. Malone (1983) identified the filing and piling strategies in a manual working environment. Piling is where

documents are heaped on top of each other in a reverse chronological order, without being assigned any labels. In filing however, information items are categorised into physical, labelled files (Malone, 1983). Chang and Ko (2008) also studied the PIM behaviour of university students, in which they observed: post-building and pre-building organising strategies. They also said that, where a folder is created, and it contains too many files without any subfolders to group them into subcategories, they tend to become piles instead of files.

Looking for an information item from one's own personal information space is termed as re-finding. Various authors have unearthed, a range of strategies that can be adopted when re-finding personal information. Teevan *et al.* (2004) saw a two-stage iterative approach to re-finding- orienteering and teleporting. Navigation and searching are other methods of re-finding information from one's personal space of information (Boardman and Sasse, 2004). Henderson (2009) also disclosed the browsing, sorting and searching re-finding methods.

Prior PIM studies reveal certain factors that affect PIM practices. These factors include format or type of information (Tungare, 2007; Teevan *et al.* (2006); individual's intended use of information (Hardof-Jaffe *et al.*, 2009; Jones *et al.* 2004), PIM tools and applications (Bergman *et al.*, 2007), skills and abilities of the individual (Jones *et al.*, 2004), size of collection (Elsweiler *et al.*, 2007), time (Boardman and Sasse, 2004), individual differences/attitudes/habits (Chang and Ko, 2008; Henderson, 2009), and memory (Elsweiler *et al.*, 2007), among others. In the practice of PIM, one is beset with numerous challenges. Challenges outlined in the literature include information fragmentation (Teevan *et al.*, 2006); imperfect human memory (Elsweiler *et al.*, 2007); inappropriate attitude and habits (Barreau, 2009); information overload (Bruce, 2005) and inadequate skills (Teevan *et al.*, 2006; Mansourian, 2008). The effects of one's PIM practices are either negative or positive depending on one's effectiveness in the face of the above challenges.

The woes and benefits of PIM on individuals and libraries have been noted by various authors (Jones, 2008; Teevan *et al.*, 2006). To help sustain and improve the effectiveness of PIM practices, the need for librarians to ensure information literacy and the various time-saving techniques and tools users can utilize in seeing to their own personal information needs have also been greatly emphasised (Fourie, 2011; Newton-Smith, 2000). Several information literacy standards and frameworks such as Information Literacy Standards for Higher Education (ACRL, 2000), The Australian New Zealand and Institute for Information Literacy (Bundy, 2004); Information Literacy Framework (CAUL, 2001), the Seven Pillars Information Skills Model developed in the UK by the Society of College, National and University Libraries (Bent and Stubbings, 2011) and Eisenberg and Berkowitz Big6 Information Skills (Eisenberg and Berkowitz, 1990) have been proposed to guide information literacy skills programs offered across tertiary institutions all over the world. Basically, these frameworks and standards seek to provide various competencies at conceptualizing information needs, organising information, evaluating information, making effective use of information in problem-solving, critical thinking and lifelong learning.

There is however the lack of studies that focus on PIM practices in the African context, let alone Ghana. Researchers in the field of Library and Information Studies have primarily focused on information management in libraries and seem to have neglected personal information management.

Theoretical framework

In the view of Jones and Teevan (2008), PIM consists of three essential groups of activities namely, keeping activities; finding and re-finding activities; and meta-level activities. According to them, these activities are efforts to establish, use and maintain a mapping between information and need.

Keeping activities are the first group of activities seen as efforts made to establish a mapping from information to need. Mapping information to need implies that, when an individual encounters an information item, one looks into the future to see (map) if there would be a need for which has to retain that information. It is assumed that, an individual would keep useful information but non-useful information will not be kept in the personal information space (PIS). The interest of the researchers in this context was not in the decisions or the factors that influenced the decisions to keep. Rather, the researchers considered the individual student who had encountered a useful information item and had decided to keep it. What keeping strategies would be employed? What factors would influence the adoption of those strategies? What problems would be faced? And how could those problems be resolved?

Finding and re-finding activities are activities that are driven by an individual's need for information to solve a problem in hand. Jones and Teevan assume that, if an individual has an information need, he seeks information to meet that need. Seeking information that is not yet encountered by the user is termed finding, and seeking information that has previously been found is termed re-finding. The interest of the researchers in this context was not in how students found or re-found information from external sources, since information seeking behaviour of students is a well researched area (Jones and Teevan, 2008). Rather, the researchers were concerned with how students re-found information in their PIS: the strategies they used, their reasons for using those strategies; the problems they encountered; and how those problems could be resolved.

Meta-level activities are in the view of Jones and Teevan, activities carried out to support the first two groups of activities (that is "keeping activities" and "finding activities"). Meta-level activities include information maintenance and organisation, which involves the updating, deleting and backing up of information in a person's PIS, and the selection and implementation of a scheme of the personal information collection (PIC); managing privacy and the flow of information, which involves activities that would enable an individual control how information gets into and out of his or her personal information space. It also includes matters of security; measurement and evaluation which involve asking a series of questions regarding the efficiency and effectiveness of the tools and methods being used to manage and use personal information; and finally making sense of things, where the individual tries to understand his PIC and its implications in his life. Concerning the meta-level activities, the researchers were interested in investigating how students organised information in their PIS; the factors influenced their organisation strategies; the problems they faced; and the possible solutions. Figure 1 gives a picture of the model explained above.

The framework above shows how broad the scope of PIM is and this study did not cover all the activities in it. That is, only the keeping activities, organising activities, and re-finding activities that pertain to the individual student's PIC were examined. Variables that were investigated include the factors that influence the keeping, organising and re-finding practices of students; the challenges students face as they perform these activities; and the effects of these practices. Thus, students' PIM

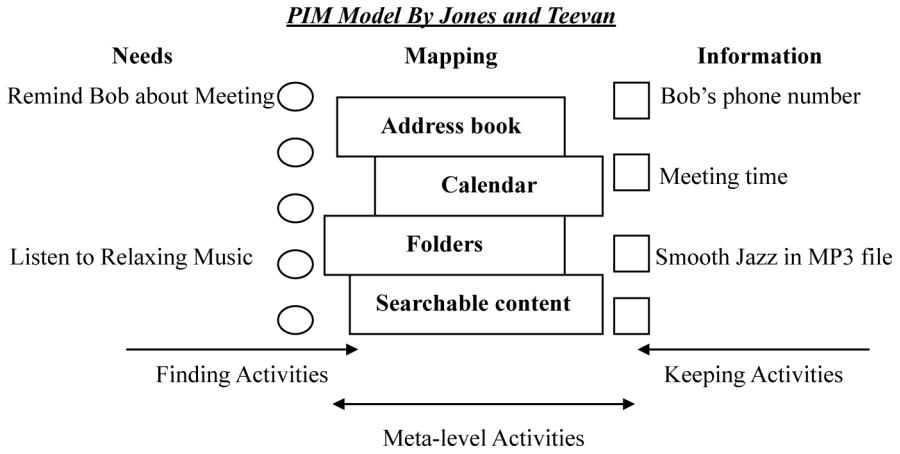

Figure 1.
PIM activities viewed as an effort to establish, use, and maintain a mapping between needs and information

Source: Jones and Teevan (2008)

practices regarding information maintenance; selection and implementation of a scheme; managing privacy and the flow of information; matters of security; measurement and evaluation; and making sense of things, were outside the scope of this study.

Research aims

The study investigated the personal information management practices of students and its implications for library services at the University of Ghana. Information is essential to the learning process and students need it for their assignments, articles, illustrations, presentations, projects, among others (Hardof-Jaffe *et al.*, 2009). But the vast amount of information available to students is far more than they can possibly use (Bruce, 2005). The information flood in the present era (Edmunds and Morris, 2000; Bruce, 2005), makes students to regularly locate, encounter, and have access to information when they do not need it, and often face difficulties to access useful, relevant information when they need it (Jones, 2008). This makes it necessary for students and libraries to adopt tactics which will ensure easy access to and use of information at the personal level when needed.

Students at the University of Ghana often keep several useful information items in their custody, which they hope to access and use later when needed. However, it has been observed that, when the need arises to re-find and use a specific information item, students face great difficulties accessing it from their own personal information space (PIS). They normally spend precious time in searching their own collections without locating the right information they want. Sometimes, students find the information later when the need for its use is already past, and consequently end up making repeated efforts to look "from scratch" for the same information that was previously at hand; at times bearing the pain of re-creating the same information they have created before; or spending extra money to acquire the same information which they have bought before. These efforts do not always help the students to get the information they want. Rather, precious time, energy and money are often wasted, and most students are left not achieving or at best compromising their objectives.

The above situation motivated this research. How do students keep, organize and retrieve information in their personal information space? Could it be that, they are not employing the appropriate PIM methods? In other words, what are the PIM practices of students at the University of Ghana? And what are the implications of students' PIM practices for library services on campus?

Objectives of the study

The research sought to:

- Identify the factors that affect the PIM practices of students at the University of Ghana.
- Determine the challenges that students encounter in their PIM activities.
- Find out how the PIM practices of students affect their academic and social life on campus.
- Examine the implications of students' PIM practices for library services at the University of Ghana.
- Propose how the PIM practices of students at University of Ghana can be improved.

Significance of the study

A thorough search of literature in the field of Library and Information Science in Africa, has seen an insignificant number of researches focused on PIM, let alone noticing how many have been done regarding the PIM practices of students. Probably, in Ghana, the subject is among the least explored. But PIM practices have an acute influence on university students (Hardof-Jaffe *et al.*, 2009), and this makes it crucial to research how Ghanaian students manage their personal information. Hence this research would not only create awareness about PIM practices of the Ghanaian student, but would also add to the few research works available on PIM, thereby contributing to the efforts at improving PIM practices among students in Ghana. This way, students can effectively deal with the anxiety and frustrations of the information age. The study would also make librarians, the university community and other stakeholders to understand the personal information situation of students in Ghana and what they can do to help improve their PIM practices.

Research design

The study adopted the survey method and selected 150 students out of the total student population of 42,692, to study. Alreck and Settle (2003) note that when the population in a study is homogeneous, or when only rough estimates are needed, a smaller sample size may be adequate. In the current study, the population was homogeneous as it only involved students of the University of Ghana. In order to ensure a proper representation of the total students' population, a proportionate sampling calculation which considered the distribution of students across their various programs of study and gender was done. Convenience sampling was then used to select the actual students who were served with the questionnaire. These techniques yielded the appropriate sample size to be selected from each category of male and female students enrolled in the various programs of study. Table I shows the distribution of students across programs of study and gender.

Data collection and analysis

Questionnaire was used to collect data from participants. It consisted of 31 closed ended questions on the keeping, organizing and re-finding practices of both paper and non-paper based documents. Questions were framed in line with the objectives of the study and the literature reviewed. Participants were allowed to select only one answer in some cases and multiple responses in others. After the questionnaire had been pretested on students from another university, the necessary corrections were made and administered to the University of Ghana students who were willing to participate in the study. Using the 16th version of the Statistical Package for Social Sciences, data collected was then analysed in consideration of the objectives of the research. This yielded results that help understand the PIM practices of the students.

Results

A 100 per cent response was obtained for the study. Table II shows the number of questionnaires that was administered to male and female students in their various programs of study. The figures reflect the actual proportionate sampling of male and female students in the various programmes on the University of Ghana campus (University of Ghana Basic Statistics, 2009).

In the following sub-sections, results pertaining to the keeping, organising and re-finding practices of students have been presented.

Students' personal information tools and applications

Students were given a list of PIM tools and applications to select those that they owned and used. These tools included personal computer, I-pod, cell phone, personal digital assistant, USB drives and e-mails. On analysing their responses, it was realised that, about half (48.7 per cent) had only one device; 17.2 per cent had two devices; 20 per cent had three; 11.3 per cent had four; 1.3 per cent had five and 0.7 per cent had six devices. Among all, it was found that the most popular PIM tools that was owned and used was cell phone, followed by personal computer and then USB drive. Personal Digital

Table I.
Students enrolled in the various programs of study at University of Ghana

Program	Male	Female	Total
Sub-degree	2,563	3,271	5,834
Undergraduate	20,886	13,468	34,354
Graduate	1,646	858	2,504
Total	25,095	17,597	42,692

Source: University of Ghana Basic Statistics (2009)

Table II.
Categories of students served with questionnaires

Program	Male	Female	Total
Sub-degree	9	11	20
Undergraduate	73	47	121
Graduate	6	3	9
Total	88	62	150

Source: University of Ghana Basic Statistics (2009)

Assistant (PDA) was the most uncommon tool, followed by I-pods. Participants were also asked to mention the types of files they kept. On their devices, audio was the commonest type of file that students kept. This was followed by digital photos which 55.3 per cent had. About half the respondents (50.7 per cent) also had Word documents. PowerPoint and Excel were however less common with the students. Students also kept different kinds of paper-based documents in their collections. Religious books were held in the collections of a little more than half (58.0 per cent) of them, and curriculum vitae remained the paper based document that very few (16.7 per cent) students possessed in their collections. Table III shows the number of PIM tools and applications that students owned and used in a typical week.

Students' PIM skill levels

To determine the level of skills of students, respondents were given some basic tasks and were asked to indicate the ones they were skilled at performing with their tools. Keeping tasks given them included copying files, snapping pictures, saving documents, cutting and pasting, creating bookmarks or favourites, typing and printing. With regard to organising creating folders, renaming files, dragging and dropping, and moving files were given. For re-finding, Windows search, searching to locate contacts on cell phone, scrolling through a list of contacts on phones, opening files, and navigating folders were the tasks that were listed. It must be noted that, being able to perform only one task is not adequate for one to complete a given PIM activity. For instance, a student cannot organise his files on his devices if he or she can only create folders, but cannot drag and drop files into that folder. Similarly, a student cannot finish performing a keeping activity when he can only cut and paste data, but cannot save the resulting document. Hence, being able to perform at least two or more tasks under a PIM activity is necessary to be said to have high computer literacy. However, about half of the students could perform only one task which is woefully inadequate, and implies, very low computer literacy. It was determined that, in terms of keeping, about half (53.3 per cent) of them could perform only one task. Also, only 11.3 per cent; 10.7 per cent and 24.0 per cent could perform 2, 3 and 4 tasks respectively. Looking at their organising skills, it was clear that, about half (48.7 per cent) of the participants could perform only one organising task. While, only 17.3 per cent; 20.0 per cent and 11.3 per cent; 1.3 per cent and 0.7 per cent could perform 2, 3, 4, 5, and 6 tasks respectively. Considering re-finding, the result was that, 57.3 per cent could perform only one task, while only 9.3 per cent; 8.0 per cent; 10.0 per cent; 14.7 per cent could perform 2, 3, 4, and five tasks respectively. Figure 2 portrays the skill level of students.

Number of tools owned	Frequency	Per cent
One (1)	73	48.7
Two (2)	26	17.3
Three (3)	30	20.0
Four (4)	17	11.3
Five (5)	2	1.3
Six (6)	1	0.7
No response	1	0.7
Total	150	100.0

Table III.
Extent of usage and ownership of PIM tools and applications among students

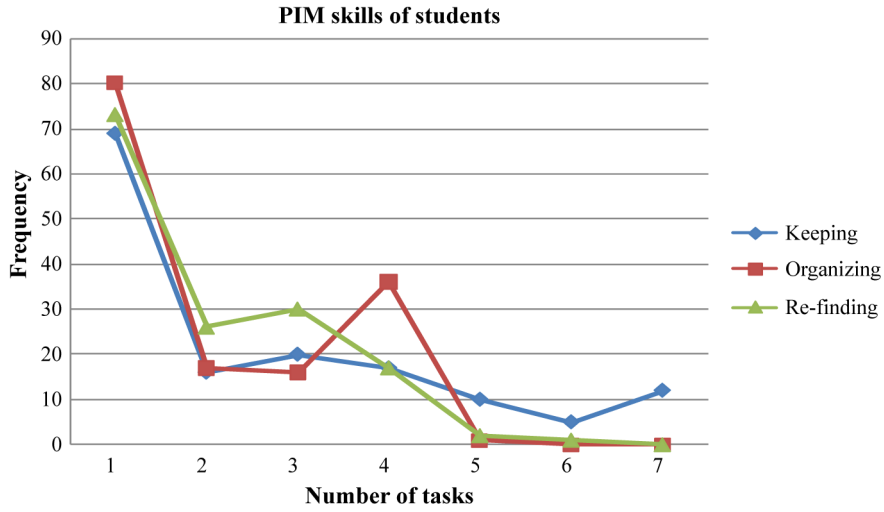

Figure 2.
The PIM skills and abilities of students

Note: Size of students' personal information collections

It can be deduced from the figure that, as the number of tasks increases, the number of students who were skilled in performing them, reduced considerably.

Students in the study were asked to estimate the number of documents they possessed, and it was determined that, while about half (50.7 per cent) of the students had very few documents (that is, between 20 and 100 documents), less than that (40.7 per cent) had the same size of collection in non-paper based format. With regards to collection of size between 101 and 200 documents, 22.7 per cent of them had this, while a smaller percentage (17.3 per cent) had the same size in non-paper based format. Students who had very large collections (that is, between 1,001 and 10,000 documents) were the fewest, forming only 4 per cent (for paper based documents) and 11.3 per cent (for non-paper based documents) of the participants in the study. On the other hand, those who had very small collections were the majority, forming 50.7 per cent (for paper based documents) and 40.7 per cent (for non-paper based documents). In a nutshell, while very few students had very large collections and managed mainly non-paper-based documents, the remaining majority kept very small collections and managed mainly paper based documents, as a few others had medium size collections. Table IV gives a summary of this.

Table IV.
Size of students' personal information collections

	Paper based		Non-paper based	
Size of collection	*n*	Per cent	*n*	Per cent
20-100	76	50.7	61	40.7
101-200	34	22.7	26	17.3
201-1,000	31	20.7	38	25.3
1,001-10,000	6	4.0	17	11.3
No response	3	2.0	8	5.3
Total	150	100	150	100

Overall, the majority of students had paper based documents while the minority had non-paper based documents. In a paired samples test, it was revealed that, this difference between students' collection sizes in paper and non-paper based formats was significant at the 0.01 level. This implies that, generally, students who managed paper-based documents were more than those who managed non-paper based documents.

It was also determined through the Pearson's correlation test that, the number of PIM tools and applications students owned, was statistically significant at the 0.01 level with the size of their non-paper based collections. This implies that, the larger the number of PIM tools a student owned, the larger the size of collection that student had. For example, a student who had two or more PIM tools had a larger collection than his/her colleague who had a smaller number of tools, say only one PIM tool or none at all. Similarly, a student who had three PIM tools had a larger collection size than his/her counterpart who owned two PIM tools, and so on. In a related analysis, the researchers used the Pearson's correlation test to determine that, there existed a significant relationship between students' keeping skills and their collection sizes at the 0.01 leve1. This presupposes that, the larger the number of tasks a student could perform, the larger the size of collection of that student was likely to be. For instance, a student capable of performing three keeping tasks (say, copying, creating bookmarks and printing) was likely to have a larger collection size than a colleague skilled in carrying out two or less tasks (example, only copying; or copying and snapping of pictures).

Students' personal information organizing practices

In order to understand students' organising practices, participants were asked how often they organised their documents. In relation to paper based documents, 14.7 per cent of the participants organised their documents "very often", whereas 36.7 per cent and 30.7 per cent organised "often" and "sometimes" respectively. In relation to non-paper based documents, 33.3 per cent of the participants organised "very often"; 27.3 per cent organised "often" and "sometimes" whereas 11.3 per cent did not organize often. Table V reports the results. Students who had non-paper based documents organised more often, than those who had paper based documents and the difference was significant at the 0.03 level in the paired-samples test. This implies that, comparing how often students organised their documents in paper and non-paper based format, students organised their non-paper based collections more often, than their paper-based collections.

The researchers got a few reasons why students organised. The foremost reason was that, they wanted to easily locate their documents when the need arose. The next

	Paper based		Non-paper based	
Organizing frequency	*n*	Per cent	*n*	Per cent
Very often	22	14.7	50	33.3
Often	55	36.7	41	27.3
Sometimes	46	30.7	41	27.3
Not often	21	14.0	17	11.3
No response	6	4.0	1	0.7
Total	150	100	150	100

Table V. How often students organised their personal information collections

reason was that, they just wanted to put their documents in order. A few others also thought that it was just good to organize.

Participants were also asked to indicate the methods they employed in organising their paper and non-paper based documents. An appreciable number of them (66 per cent) habitually kept their important paper-based documents such as certificates in special places, usually file folders whereas 32 per cent did not. Suitcases and shelves were also used but on minor occasions. With respect to how they organised their non-paper based collections, the most prevalent organising practice among students was that, 1-20 files were kept in one folder while others also kept more than 20 files in one folder. Table VI illustrates the number of files that students kept in their average folders. It could be observed from the table that, as the number of files kept in one folder increased, the number of students decreased. This shows that, in managing their electronic documents, most students employed the filing strategy by keeping only a few files in one folder, whereas a few others employed the piling strategy by keeping so many files in their commonest folders.

Students' uses of personal information

Students were asked to mention some of the uses to which they put their personal information. Majority (62 per cent) of students used information for academic work. According to 22.7 per cent and 24.7 per cent of the students, they used their personal information to keep in touch with their friends and for leisure respectively. Also, 28.7 per cent of the students said they kept their information in order to be reminded of their commitments, while 26 per cent of them also used it to recall their past, and the same percentage pointed at their career purposes.

Re-finding practices

Students were asked to describe the strategies they used when re-finding information in their personal space. Regarding non-paper based documents, majority of the students (46.0 per cent) first tried to re-find information from their PIM tools by first remembering filenames, and based on this to identify the files were seeking. The second most dominant strategy was that, less than half (36.7 per cent) conducted searches, based on details of the file they could remember. A few (20 per cent) of the students also said that, they kept navigating folders, until they found the information item they wanted. In re-finding their paper-based documents, the commonest approach was to go straight to pick the document right at where it was placed. The next most popular style was to go through all documents until a particular document was found. To search any place a document is thought to be found was the re-finding strategy that only 24 per cent of the students adopted. Tables VII and VIII show students' re-finding strategies in non-paper and paper based formats respectively.

Table VI.
Number of files kept in the average folder

	Number of files				
	1-20	21-40	41-60	61-100	Total
Frequency	63	36	23	22	150
Per cent	42	24	15.3	14.7	100

The memory and personal information management

The researchers wanted to know how easily students could remember details about their documents; for example, where exactly they placed their documents. In paper and non-paper based formats, less than half (48 per cent) said it was "easy", 22.7 per cent said it was "very easy", 25.3 per cent said sometimes it was easy, and only 3.3 per cent said it was not easy. In relation to how often it was for the students to remember names they assigned to their files, only 28 per cent said "very often"; 39.3 per cent said "often"; 21.3 per cent said sometimes, whereas 10.7 per cent said "not often".

Effectiveness of student's PIM practices

Students were asked how easily they could locate their documents in times of need. An average of 34.6 per cent of students was very effective, followed by 48 per cent who was "effective". These findings are as summarised in Table IX. There was no significant difference in their level of effectiveness in terms of format. That is, students' performance in both format was no different.

Discussion

The purpose of the study was to investigate the personal information management practices of students and to examine its implications for library services in Ghana. On the whole, individual students' PIM practices were diverse. The main factors that accounted for this diversity in their practices were format, PIM skills and abilities, size of collections, individual habits, and memory capabilities. As the findings reveal, there

	Frequency	Per cent
I keep opening (navigating) folders until I find it	33	22
I search using any details I remember about the file	67	44.7
I remember filename and try identify the file with that	84	56.0
Total	150	100

Table VII. Students' re-finding strategies for non-paper based documents

	Total	Per cent
I go through all my paper documents until I find it	55	36.7
I search any place I think it may be found	36	24
I go straight to pick the document right at where I placed it	58	38.7
Total	150	100

Table VIII. Students' re-finding strategies for paper-based documents

	Non-paper based files		Paper based document	
Effectiveness	*n*	Per cent	*n*	Per cent
Very easily	51	34	53	35.3
Easily	62	41.3	84	56
Sometimes easily	31	20.7	10	6.7
Not easily	6	4.0	1	0.7
Total	150	100	150	100

Table IX. Effectiveness of students' PIM practices

was no significant differences between students' PIM effectiveness in both paper and non-paper based formats. However, there is more that the library can do to make students more efficacious in their PIM practices. Particular areas where students had challenges included their fragmented information, computing skills, habits, and the ability to remember details about their own documents.

Students managed different types of information in different formats, as they kept information in paper-based format and also used different PIM tools, mainly cell phones, personal computers and USB drives to handle non-paper based documents. This supports the observations of Hardof-Jaffe *et al.* (2009) and Bruce (2005) that, students manage different kinds of information in a range of formats. These imply that students did not have one place for keeping all information. Rather, their information items were being managed across different tools and locations. This finding agrees with Tungare's (2007) observation that, most of our information is scattered across multiple devices and locations, leading to the problem of information fragmentation. Therefore, students require skills to better manage documents in different tools and disparate locations and to integrate information collections in these formats.

As the test revealed, the more the skills a student had, the larger the number of documents he/she was capable of keeping and organising. However, from the results, only a few students had very large collections. This was not surprising because, about half of the students could perform only one keeping task, and this was same with organising. This implies that, those who had the large collections and organised often, were those who had a range of skills to perform most of the keeping and organising operations. This means that, most of the students had limited abilities to perform certain basic computing operations. Particularly, less than half of the students could save application documents; cut and paste; create bookmarks; move files; type and print; locate contacts on phone by searching or by scrolling through a list of contacts on phone; navigate through folders; open files; and drag and drop. Therefore, there is the need to help the students in these areas.

Students exhibited diverse PIM habits across different collection sizes and formats. For example, in paper based format, most students kept important documents of theirs at special places, while others did not, and left their documents scattered at various locations. Also, in organising non-paper based documents, majority of the students employed the filing strategy by keeping only a few files in one folder, while a few others employed the piling strategy by keeping so many files in their average folders. This practice of students was consistent with Malone's (1983) suggestion that, it is better to file than pile. Thus, students' had appreciable habits that need to be encouraged and also enhanced through the activities of PIM clubs. Also, similar to the observation by Reimer *et al.* (2009) a few students had problems remembering details about their own documents. So, the introduction of more techniques to enable students do better in their ability to remember would be a good idea.

Effectiveness in PIM is the extent to which one can locate his/her documents when he/she needs it. Students needed their personal information primarily for academic work and secondarily for their social pursuits. However, not all students found it easy locating their documents. Therefore, there is the need to attend to the PIM practices of students and seeks ways to improving them.

Implications for library services

Students' PIM effectiveness was limited by a few factors, that as Newton-Smith (2000) puts it, libraries can help resolve through information literacy (IL) programs. Generally, available IL frameworks require an information literate student to be able to recognise the need for information and determine the nature and extent of the information needed; find the needed information effectively and efficiently; critically evaluate information and the information seeking process; manage information collected or generated; apply prior and new information to construct new concepts or create new understandings and also use information with understanding and acknowledge the cultural, ethical, economic, legal, and social issues surrounding the use of information (Bundy, 2004).

Prior studies reveal that, students often encounter so much information (Hardof-Jaffe *et al.*, 2009; Jones, 2008) and often keep them, leading to the creation of large personal information collections. In the current study however, most students had very small collections although they often encountered much information. This was not a surprise because, most of the students had very low computing skills. It was determined that, the more keeping tasks a student had the skill to carry out, the larger his/her size of collection was. However, about half of them had the ability to perform only one keeping operation. Therefore, since an aspect of information literacy is about computer or tool literacy (ACRL, 2000), and emphasises on the ability to effectively and efficiently use information tools, we recommend that, during information literacy programs, students should be trained how to use PIM tools to perform several basic keeping tasks, especially, cutting and pasting, typing, printing and creating bookmarks.

As Jones (2008) states, useful information would be kept, but non-useful information would be let go. But the usefulness of a given information item is determined only after evaluating it against one's future needs. Probably, students kept very small collections because they had limited ability to evaluate much of the copious information they encountered, for future usefulness. Therefore, since information literacy is also about how information is evaluated for reliability and authenticity (ACRL, 2000) before use, we recommend that, students should also be taught how to evaluate the information they encounter and use, to determine whether they would need to use it again in the future. This would enable them to determine which of the numerous information they encounter would need to be kept and utilized.

Third, it was also clear that, the more the PIM tools a student owned, the larger the size of his collection. However, about half of the students had only one device, while only a few had two and so on. Perhaps, this justifies why some authors claim that, in spite of the proliferation of ICT tools, they are expensive (Sonaike, 2004) and are of low usage (Mangesi, 2007) among most Ghanaian students. Mobile phones, personal computers and USB drives were the commonest tools among students, probably because, they were among the commonest products that were being dumped on the Ghanaian market.

It was found that many of the students, especially those with paper-based documents did not organise often. This was because, those students found it to be time consuming and difficult to do it well. Therefore, since information literacy also requires one to be able to classify, store, manipulate and redraft information collected or generated (Bundy, 2004), we suggest that, during IL sessions, students should be taught time-saving ways to organize, represent, arrange, and also file their personal information items. This would go a long way to improve the students' ability to re-find. It was noted that, not all students were able to locate their documents when they

needed them. And since IL is concerned with finding information (Bundy, 2004), during library IL programs, students need to be trained in all possible situational strategies required to re-find information in their personal collections.

In short, at information literacy training programs, the focus should not only be on how students can obtain information and use from external sources, but also, how they can manage the same information (they have collected and used), for future re-use. To be efficacious, we recommend that libraries adopt or develop an information literacy framework that does not only focus on "external" information sources, but also "personal" information collections. Furthermore, librarians need to spearhead the creation and management of the PIM clubs and activities on campus. These clubs should aim at advocating for better PIM practices among students, soliciting support for PIM activities, and also encouraging students' participation on campus, among others.

Limitations of the research

From the PIM framework that was adopted, the study focused on the core activities of PIM namely: keeping, organising and re-finding. In order to provide a complete picture of the PIM situation of students, it is expected that subsequent studies would cover the remaining activities, namely, information maintenance; selection and implementation of a scheme; managing privacy and the flow of information; matters of security; measurement and evaluation; and making sense of things.

Conclusion and further research

More needs to be done by the library to help improve the PIM practices of students. To be more efficacious, the areas where students were found to have limitations should be considered, that is, fragmented information; computing skills in terms of typing, printing, cutting and pasting, navigating through folders, creating bookmarks, dragging and dropping, moving files; habits, and the memory. In addition, there would be the need to adopt or develop comprehensive information literacy training programs that lay strong emphasis on students' PIM practices. Plus, conscientious student-oriented PIM researches in Ghana; support from university administrators, PIM tool developers, and benevolent individuals and organisations, would be great complements to making students' PIM practices better. In brief, conscious efforts are required to shape, improve, support and integrate students' PIM habits, skills, memory and personal information collections respectively.

References

Alreck, P. and Settle, R. (2003), *The Survey Research Handbook*, 3rd ed., McGraw-Hill/Irwin, New York, NY.

Association of College and Research Libraries (2000), *Information Literacy Competency Standards for Higher Education Chicago*, American Library Association, available at: www.ala.org/ala/acrl/acrlstandards/informationliteracycompetency.htm (accessed 3 May 2011).

Barreau, D. (2009), "'Management' of personal information, not only 'recovery' of personal information", *Professional Information*, Vol. 18 No. 4, pp. 361-4.

Bent, M. and Stubbings, R. (2011), *Seven Pillars of Information Literacy: Core Model for Higher Education*, SCONUL, London, available at: www.sconul.ac.uk/sites/default/files/documents/coremodel.pdf (accessed 4 July 2011).

Bergman, O., Beyth-Marom, R. and Nachmias, R. (2007), "The user-subjective approach to personal information management systems design: evidence and implementations", *The American Society for Information Science and Technology*, Vol. 59 No. 2, pp. 235-46.

Boardman, R. (2004), "Improving tool support for personal information management", Doctoral dissertation, Imperial College, London.

Boardman, R. and Sasse, M.A. (2004), "Stuff goes into the computer and doesn't come out: a cross-tool study of personal information management", *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Vienna, Austria*, ACM Press, New York, NY.

Bruce, H. (2005), "Personal, anticipated information need", *Information Research*, Vol. 10 No. 3, paper 232, available at http://InformationR.net/ir/10-3/paper232.html (accessed 10 February 2011).

Bundy, A. (Ed.) (2004), *Australian and New Zealand Information Literacy Framework: Principles, Standards and Practice*, Australian and New Zealand Institute for Information Literacy, ANZIIL & CAUL, Adelaide, available at: www.caul.edu.au /content/upload/files/info -literacy/InfoLiteracyFramework.pdf (accessed 3 March 2011).

Chang, S.J. and Ko, M.H. (2008), "Behaviors of PIM in context of thesis and dissertation research", *CHI 2008 Workshop, Florence, Italy*, ACM Press, New York, NY.

Civan, A., Jones, W., Klasnja, P. and Bruce, H. (2008), "Better to organize personal information by folders or by tags?: the devil is in the details", *68th Annual Meeting of the American Society for Information Science and Technology (ASIST 2008), Columbus, OH*.

Council of Australian University Librarians (2001), "Information Literacy Standards", Council of Australian University Librarians, Canberra, available at: www.caul.edu.au/caul-doc/Inf oLitStandards2001.doc (accessed 3 May 2011).

Edmunds, A. and Morris, A. (2000), "The problem of information overload in business organizations: a review of the literature", *International Journal of Information Management*, Vol. 20 No. 1, pp. 17-28.

Eisenberg, M.B. and Berkowitz, R.E. (1990), *Information Problem Solving: The Big Six Skills Approach to Library & Information Skills Instruction*, Ablex Publishing Corporation, Norwood, NJ, available at: www.wellsborosd.k12.pa.us/../lib/../Big6%20Model.doc (accessed 3 May 2011).

Elsweiler, D., Ruthven, I. and Jones, C. (2007), "Towards memory supporting personal information management tools", *Journal of The American Society For Information Science And Technology*, Vol. 58 No. 7, pp. 924-46.

Hardof-Jaffe, S., Hershkovitz, A., Abu-Kishk, H., Bergman, O. and Nachmias, R. (2009), "Students' organization strategy of personal information space", *Journal of Digital Information*, Vol. 10 No. 5, pp. 1-17.

Henderson, S. (2009), "Guidelines for the design of personal document management user interfaces", *Personal Information Management: PIM 2009 ASIS&T 2009 Workshop, Vancouver, Canada*.

Fontaine, M. (2000), "High tech/grassroots education: community learning centers (CLCS) for skill building", *TechKnowLogia, Knowledge Enterprise*, July/August, pp. 28-31, available at: www.techknowlogia.com/TKL_Articles/PDF/146.pdf (accessed 11 February 2012).

Fourie, I. (2011), "Personal information and reference management: librarians' increasing creativity", *Library Hi Tech*, Vol. 29 No. 2, pp. 387-93.

Jones, W. (2008), *Keeping Found Things Found: The Study and Practice of Personal Information Management*, Morgan Kaufman, Burlington, MA.

Jones, W. and Bruce, H. (2005), "Personal information management, a report on the NSF sponsored workshop on personal information management, Seattle, WA", available at: http://pim.ischool.wash ington.edu/final PIM report.pdf (accessed 3 January 2011).

Jones, W. and Teevan, J. (Eds) (2008), *Personal Information Management*, University of Washington Press, Seattle, WA.

Jones, W., Bruce, H. and Dumais, S. (2004), "Information behaviour that keeps found things found", *Information Research*, Vol. 10 No. 1, paper 207, available at: http://InformationR.net/ir/10-1/paper207.html (accessed 10 February 2011).

Malone, T.W. (1983), "How do people organize their desks: implications for the design of office information-systems?", *ACM Transactions on Office Information Systems*, Vol. 1 No. 1, pp. 99-112.

Mangesi, K. (2007), "Survey of ICT and education in Africa: Ghana country report", available at: www.infodev.org/en/Document.406.pdf (accessed 13 December 2011).

Mansourian, Y. (2008), "Keeping a learning diary to enhance researchers' understanding of and users' skills in web searching", *Library Review*, Vol. 57 No. 9, pp. 690-9.

Martey, A. (2004), "ICT in distance education in Ghana", *Library Hi Tech News*, Vol. 21 No. 5, pp. 16-18.

Ndzibah, E. (2009), "CSR in Ghana? Diversity should not mean dumping", *Management of Environmental Quality: An International Journal*, Vol. 20 No. 3, pp. 271-7.

Newton-Smith, C.J. (2000), "The personal information management behaviour of academics: implications for librarians' support", M. Com. Thesis, University of Western Australia, available at: http://repository.uwa.edu.au:80/R/-?func=dbin-jump-full&object_id=9364& amp; current_ base=GEN01-INS01 (accessed 10 February 2011).

Reimer, Y.J., Brimhall, E., Cao, C. and O'Reilly, K. (2009), "Empirical user studies inform the design of an e-notetaking and information assimilation system for students in higher education", *Computers & Education*, Vol. 52 No. 4, pp. 893-913.

Sonaike, A. (2004), "The internet and the dilemma of Africa's development", *International Communication Gazette*, Vol. 66 No. 1, pp. 41-61.

Teevan, J., Jones, W. and Bederson, B.B. (2006), "Personal information management", *Communication of the ACM*, Vol. 49 No. 1, pp. 40-3.

Teevan, J., Alvarado, C., Ackerman, M.S. and Karger, D.R. (2004), "The perfect search engine is not enough: a study of orienteering behavior in directed search", paper presented at the CHI 2004, Vienna, Austria.

Thomson, L. (2009), "The information experience of a printing company employee in a home office", *Faculty of Information Quarterly*, Vol. 2 No. 1, available at: https://fiq.ischool.utoronto. ca /index.php/fiq/article/view/62/185 (accessed 3 May 2011)

Tungare, M. (2007), "Understanding the evolution of users' personal information management practices", in *Proceedings of the Eleventh IFIP TC13 International Conference on Human-Computer Interaction – INTERACT 2007 Doctoral Consortium*.

University of Ghana Basic Statistics (2009).

Corresponding author
Francis Osae Otopah can be contacted at: foosae@gmail.com