

Knowledge sharing behaviour and demographic variables amongst secondary school teachers in and around Gaborone, Botswana

Authors:

Isaac C. Mogotsi^{1,2}
J.A. (Hans) Boon¹
Lizelle Fletcher³

Affiliations:

¹Department of Information Science, University of Pretoria, South Africa

²Department of Accounting and Finance, University of Botswana, Botswana

³Department of Statistics, University of Pretoria, South Africa

Correspondence to:

Isaac Mogotsi

Email:

Isaac.Mogotsi@mopipi.ub.bw

Postal address:

Business Information Systems Group, Department of Accounting & Finance, University of Botswana, Private Bag UB00701, Gaborone, Republic of Botswana

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The purpose of this study was to investigate the relationships between knowledge sharing behaviour and the demographic variables gender, age, organisational tenure and professional tenure. Following a correlational survey approach, the study sourced its data from senior secondary school teachers in and around Gaborone, Botswana. Knowledge sharing behaviour was measured using an instrument sourced from the extant literature. No statistically significant relationship was detected between knowledge sharing behaviour and gender, age, or professional tenure. Only organisational tenure weakly negatively correlated with knowledge sharing behaviour. Thus, according to these findings, demographic variables do not appear to be important determinants of knowledge sharing behaviour.

Introduction

Contemporary economies place a high premium on knowledge. According to the now widely established knowledge-based theories of the firm (Grant 1996; Kogut & Zander 1992; Nonaka, Toyama & Nagata 2000; Prahalad & Hamel 1990; Spender 1996) organisations exist primarily to integrate knowledge. The essence of these theories is that in as much as production involves the transformation of inputs into outputs, the critical input in production, which is also the primary source of value, is knowledge (Grant 1996). By implication, organisations that effectively manage and leverage knowledge are more likely to prosper than those that do not. Indeed, empirical research (Bontis 1999; McKeen, Zack & Singh 2006) consistently links effective knowledge management to superior organisational performance.

As Botha and Fouché (2002:282) correctly argue, knowledge per se cannot be managed: as such, the focus of knowledge management is to positively influence the context in which people create, share, and generally exploit knowledge. Stimulating knowledge sharing, in particular, remains an important thrust of the knowledge management movement. Bouthillier and Shearer (2002) posit that the focus of knowledge management is knowledge sharing. It is when individuals share knowledge that organisational knowledge stocks grow and organisational learning occurs. Knowledge sharing helps organisations avoid reinventing the wheel and thus be better prepared to seize new opportunities as they arise, whilst avoiding past mistakes. Knowledge sharing also enables knowledge transfer, which is concerned with the flow of knowledge between larger organisational entities such as departments and organisations themselves (see Ipe 2003). That famous lament by a former executive of the Hewlett-Packard Company – 'if only HP knew what HP knows' (see Sieloff 1999) – was an endorsement of the importance of knowledge sharing to organisational effectiveness. As it has already been noted, effective knowledge sharing has a positive impact on organisational performance (Chen 2006; Du, Ai & Ren 2007; Jacobs & Roodt 2007; Lin 2007; Pai 2006; Yang 2007).

Knowledge sharing defined

Hansen and Avital (2005:6) defined knowledge sharing behaviour as '... behaviour by which an individual voluntarily provides other social actors (both within and outside an organization) with access to his or her unique knowledge and experiences'. An important aspect of this definition is the idea that knowledge sharing is voluntary. In this regard, Hansen and Avital's definition of knowledge sharing bears more than a passing resemblance to Jarvenpaa and Staples 2000's view of information sharing. According to Jarvenpaa and Staples (cited in Hansen & Avital 2005:6), it is the willingness to share that distinguishes 'information sharing' from 'involuntary information reporting'. Knowledge sharing similarly 'represents a volitional act of providing others with (...) access to one's own knowledge and expertise' (Hansen & Avital 2005:6).

It is also helpful to distinguish between knowledge donating and knowledge collecting. According to Van den Hooff and De Ridder (2004:118) knowledge donating refers to 'communicating to

others what one's personal intellectual capital is' whilst knowledge collecting is 'consulting colleagues in order to get them to share their intellectual capital'. As Van den Hooff and De Ridder further note, both processes are active, in other words, in donating, the individual who plays the role of knowledge source actively communicates his or her knowledge to others, whilst in the role of knowledge receiver the individual actively seeks out knowledge from others. Van den Hooff and De Ridder's distinction between 'knowledge collecting' and 'knowledge donating' is similar to, though perhaps more general than, the distinction between 'knowledge seeking' and 'knowledge contribution' made by He and Wei (2009). The latter distinction appears to be limited to knowledge sharing through computer-mediated knowledge management systems. Nevertheless, He and Wei's approach supports Van den Hooff and De Ridder's conceptualisation of knowledge sharing as a two-dimensional construct.

Correlates of knowledge sharing behaviour

Researchers have identified a number of variables that are related to knowledge sharing behaviour. Ipe (2003) conveniently placed them into four main groups, namely, (1) the nature of knowledge, (2) motivation to share, (3) opportunity to share and (4) the culture of the work environment. It is perhaps trivially obvious that the nature of the knowledge being shared will influence knowledge sharing behaviour. For instance, explicit knowledge, being easily modifiable, would be easier to share than tacit knowledge. With respect to the motivation to share knowledge, empirical studies have shown that factors such as enjoyment in helping others and self-efficacy can be strong motivators of knowledge sharing behaviour (Lin 2007). However, even when individuals feel motivated to share knowledge, such sharing will be subject to the availability of the opportunity to do so, with information and communications technology – frequently in the form of electronic knowledge repositories – routinely used to facilitate knowledge sharing (Cabrera, Collins & Salgado 2006). The culture of the work environment also plays an important role, with researchers reporting that dimensions such as communication climate and organisational justice do in fact influence knowledge sharing behaviour (Kim & Lee 2006). For a more comprehensive review of the literature on the correlates of knowledge sharing behaviour, see Mogotsi (2009).

Problem statement

Whilst the body of empirical literature on the correlates of knowledge sharing behaviour is growing, literature that focuses on the role of demographic variables remains scarce. Furthermore, as Gaffoor and Cloete (2010) note, knowledge management studies tend to focus on the private sector, with scant attention paid to the public service sector. Moreover, in the few studies that do consider the public service sector, the focus tends to be on Western contexts with little focus on

developing countries. This study investigates the relationship between demographic variables (gender, age, organisational tenure and professional tenure) and knowledge sharing behaviour in the context of the public service sector in a developing country in Africa. Specifically, the study seeks to answer the following research questions:

- Are gender and knowledge sharing behaviour related?
- Does knowledge sharing behaviour vary with age?
- Is knowledge sharing behaviour related to organisational tenure?
- Is knowledge sharing behaviour related to professional tenure?

In the following section, we draw from the extant literature to derive the hypothesis tested in the present study.

Literature reviewed to formulate research hypotheses

Gender

Gender appears to influence knowledge sharing behaviour. Drawing from social exchange theory, Boardia, Irmer and Abusah (2006) investigated the influence of evaluation apprehension and perceived benefits of knowledge sharing on the intention to share knowledge. In their study, these researchers considered two contexts, namely, when sharing occurs directly between individuals and when sharing occurs through contributions to an electronic knowledge management system. Women exhibited higher perceptions of the benefits of knowledge sharing than men in both contexts, such as whether knowledge sharing occurred interpersonally or via a knowledge management system. Given these findings, one would expect women to be more likely to engage in knowledge sharing than men.

Findings from other studies, too, suggest that gender may influence knowledge sharing behaviour. Taylor (2004) found that the use of knowledge management systems was significantly influenced by gender, with men consistently reporting higher levels of usage of the email, data mining, knowledge repository and yellow page components of the knowledge management system investigated than women. Lin's 2006 study investigated the effect of instrumental and expressive ties on knowledge sharing behaviour. Instrumental ties are transactional in nature; they involve a person gathering information, advice and resources necessary to accomplish a task, whilst expressive ties involve expressions of interpersonal affect, which may be positive (e.g. friendships) or negative (e.g. enmities) (Umphress *et al.* 2003:742). Lin's study indicated that gender moderated the effect of instrumental and expressive ties on knowledge sharing; specifically, the relationship between instrumental ties and knowledge sharing was stronger for women, whilst that between expressive ties and knowledge sharing was stronger for men.

All these studies would seem to suggest that gender influences knowledge sharing behaviour even if only indirectly, in other words, by influencing other variables that are themselves

directly related to knowledge sharing behaviour. In the present study, therefore, it is hypothesised that:

- **Hypothesis 1:** Women are more likely to engage in knowledge sharing behaviour than men.

Age

Riege (2005) includes differences in age amongst the 'three-dozen knowledge-sharing barriers managers must consider' that he lists in his paper, although he does not provide details of how age might act as a barrier to knowledge sharing. Presumably, though, individuals might be more willing to share with members of their age group than with significantly younger or older colleagues, a sentiment supported by Ojha's 2005 study involving members of software project teams. These arguments, however, do not consider how knowledge sharing behaviour would act as a function of age. For that, it would be instructive to cast the net wider and consider the broader organisational behaviour literature in order to draw parallels that might help predict the nature of the relationship between these two variables.

Knowledge sharing behaviour as defined in the present study bears a strong resemblance to organisational citizenship behaviour as defined by Organ, Podsakoff and MacKenzie (2006:3) as 'individual behaviour that is discretionary, not directly or explicitly recognized by the formal reward system, and in aggregate promotes the efficient and effective functioning of the organization'. Thus, one might expect the relationship between knowledge sharing behaviour and age to be akin to that between organisational citizenship behaviour and age. Here, the study by Garg and Rastogi (2006) is of particular interest because it considered the relationship between age and organisational citizenship behaviour amongst schoolteachers. In this study, older teachers exhibited more pro-social behaviour than their younger colleagues. In the present study, therefore, we hypothesise as follows:

- **Hypothesis 2:** Compared to younger teachers, older teachers are more likely to engage in knowledge sharing behaviour.

Organisational and professional tenure

Tenure appears to have some effect on knowledge sharing. Boardia, Irmer and Abusah (2006) found organisational tenure to be a good predictor of knowledge sharing when knowledge is shared interpersonally, although not so when sharing occurs through databases. Additionally, they reported negative correlations between tenure and evaluation apprehension whether knowledge was shared interpersonally or through databases, which would seem to suggest an indirect link between organisational tenure and knowledge sharing behaviour. Watson and Hewett (2006) argued that organisational tenure would be positively related to knowledge sharing behaviour because as tenure increases so do trust and commitment to the organisation and its process. Watson and Hewett's argument is reasonable

because both trust (Chowdhury 2005; Wang *et al.* 2007) and commitment (Van den Hooff & De Ridder 2004) have been found to be positively related to knowledge sharing behaviour. In fact, Watson and Hewett's findings supported their hypothesis.

Boardia, Irmer and Abusah (2006), and Watson and Hewett (2006) focused specifically on organisational tenure. However, it seems plausible that tenure in general will be related to knowledge sharing behaviour; tenure, generally, should also be positively correlated with trust and commitment, which in turn ought to be positively correlated with knowledge sharing behaviour. For instance, Bakker *et al.* (2006) reported a positive correlation ($0.19; p < 0.05$) between team tenure and knowledge sharing, indicating that the longer team members have been together, the more likely they are to engage in knowledge sharing behaviour. Intuitively, one would expect affective commitment to the profession to grow with tenure in the profession; consequently, knowledge sharing behaviour, driven by a desire to contribute to the growth of the profession, should grow with professional tenure. With regard to organisational and professional tenure, therefore, we hypothesise as follows:

- **Hypothesis 3:** Knowledge sharing behaviour will be positively correlated to organisational tenure.
- **Hypothesis 4:** Knowledge sharing behaviour will be positively correlated to professional tenure.

Methodology

Study context

The present study was designed as an analytical survey, with data collected from a sample of teachers selected from a six public senior secondary schools in and around Gaborone, Botswana. In Botswana, senior secondary schools refer to schools that prepare students for the Botswana General Certificate of Secondary Education (BGSE) examinations, deemed equivalent to Cambridge University's International General Certificate of Secondary Education (IGSE). Students enter senior secondary schools after undertaking seven years of primary and three years of junior secondary schooling. Teachers in these schools generally have Bachelor's degrees or higher.

In order to undertake the study, permission had to be sought from a number of authorities. Firstly, it was necessary to get Botswana government approval and because schools fall under the Ministry of Education, permission was sought from the Permanent Secretary in the said ministry. Schools in Botswana are divided into a number of regions. Thus, having obtained the overall research permit from the ministry, it was then necessary to seek permission from the appropriate regional chief education officer. With this permit duly obtained, individual school heads could then be approached to seek their permission to approach teachers in their schools to participate in the study. Finally, each questionnaire had a covering letter requesting individual teachers to participate in the study. Teachers were informed that their participation

was voluntary and that they could pull out of the study any time they wished.

Measuring instruments

Amongst the self-report knowledge sharing scales, the one developed by Van den Hooff and colleagues (De Vries, Van den Hooff & De Ridder 2006; Van den Hooff & De Leeuw van Weenen 2004; Van den Hooff & De Ridder 2004) is particularly attractive because of its ability to measure two dimensions of knowledge sharing, namely, knowledge donating, and knowledge collecting. Lin (2007) modified Van den Hooff & De Leeuw van Weenen (2004)'s knowledge sharing scale to produce one in which no reference is made to departments within the company. This is particularly useful in school contexts where teachers are assigned to departments on the basis of the subjects they teach, raising the possibility of a teacher belonging to more than one department. In any case, there is no intention in the current study to investigate the influence of the department (to which a teacher belongs) on knowledge sharing behaviour, and no suggestion from the reviewed literature that this might be a worthwhile endeavour to pursue. Lin's knowledge sharing instrument was adopted for the current study. For the purposes of this study, the scale was modified, replacing 'company' with 'school' to make the instrument directly relevant to the study participants. The final knowledge sharing behaviour used in the study is shown as Table 1.

Results

Sample description

Out of the 283 returned questionnaires, 147 (52%) were from female teachers, whilst 133 (47%) were from male teachers; 3 (1%) did not mention their gender, presumably because they were uncomfortable to do so, or did not see what its bearing would be on the study. Nevertheless, looking at these figures, it can be seen that the sample was fairly well balanced in terms of gender. Teacher age ranged from a minimum of 21 years to a maximum of 63 years (a range of 42 years), with a mean of 37.3 years and a standard deviation of 7.3. Most teachers were quite young, with approximately half under 36 years old. Professional tenure ranged from one month to 42 years, with a mean of 12.0 years and a standard deviation of 7.5. Half of the teachers had been teaching for no more than 10

years. With respect to organisational tenure, approximately 50% of the teachers had only been at their schools for no more than three years; the mean organisational tenure, though, was 3.9 years, with a standard deviation of 3.7.

Reliability of the knowledge sharing behaviour scale

Item analysis of the knowledge sharing behaviour scale (see Table 1) yielded a Cronbach's coefficient α of 0.82, with all the items strongly positively correlated with the scale total. The first three items were intended to measure knowledge donating, whilst the last four were intended to measure knowledge collecting. The knowledge donating items on their own yielded a Cronbach's coefficient α of 0.70, whilst the knowledge collecting items on their own yield a Cronbach's coefficient α of 0.87. However, principal axis factoring with both the Eigenvalue > 1 rule and inspection of the scree plot revealed that the seven-item scale was, for the sample under consideration, unidimensional, explaining 76% of the variance in the data. The reason for the unidimensionality of the scale might be that the differences in the items were too subtle for the respondents to notice. In particular, the use of the word share might have been construed as suggesting a bidirectional, rather than unidirectional, flow of knowledge and information, thus nullifying the distinction between knowledge donating and knowledge collecting. Further statistical analysis was thus based on the seven-item unidimensional knowledge sharing scale with a coefficient α of 0.82.

Hypothesis testing

The Pearson correlation coefficient was used to quantify the relationships between demographic variables (age, organisational tenure and professional tenure) and knowledge sharing behaviour. Age and professional tenure were not statistically significantly related to knowledge sharing behaviour, so hypotheses two and four were not supported. Organisational tenure and knowledge sharing behaviour were negatively correlated ($r = -0.14, p < 0.05$), providing some support for hypothesis three. The Levene test for variability ($F = 0.59, p = 0.44$) suggested that the difference in the variance of the knowledge sharing behaviour scores for men and women was not statistically significant. Furthermore, with $t(277) = -1.01, p = 0.31$, the difference in the mean knowledge sharing behaviour scores for men and women was not statistically significant. Thus, hypothesis one was also not supported.

Discussion

This study examined the relationships between gender, age, professional tenure and organisational tenure on one hand, and knowledge sharing behaviour on the other. The literature on the relationship between gender and knowledge sharing, whilst limited, would seem to suggest that women should be more inclined to both donate and collect knowledge than men. In this study, however, no statistically significant relationship was identified between gender and knowledge

TABLE 1: Knowledge sharing behaviour scale.

Item number	Description
1	When I've learned something new, I tell my colleagues about it (KD).
2	When they have learnt something new, my colleagues tell me something about it (KD).
3	Knowledge sharing among colleagues is considered normal in my school (KD).
4	I share information with my colleagues when they ask for it (KC).
5	I share my skills with colleagues when they ask for it (KC).
6	Colleagues in my school share knowledge with me when I ask them to (KC).
7	Colleagues in my school share their skills with me when I ask them to (KC).

Note: This table was modified from Lin, H.F., 2007, 'Knowledge sharing and firm innovation capability: An empirical study', *International Journal of Manpower* 28(3/4), 315–332, viewed 20 May 2010, from <http://dx.doi.org/10.1108/01437720710755272>. KC, knowledge collecting; KD, knowledge donating.

sharing behaviour. This may very well be due to our failure to distinguish between (biological) sex and (psychological) gender. Indeed, in this study, we used gender to refer to biological sex. As noted earlier in this paper, biological sex appears to influence knowledge sharing behaviour indirectly by influencing other variables that themselves influence knowledge sharing behaviour directly.

Bem (1974) devised an instrument for measuring psychological gender. Using this often cited instrument, it is possible to classify individuals as sex-typed (i.e. men exhibiting 'male' values and women exhibiting 'female' values), cross sex-typed (men exhibiting 'female' values or women exhibiting 'male' values), or androgenous (i.e. individuals showing little difference in their masculinity and femininity scores). Using this instrument, researchers (e.g. Todman and Day, 2006) have shown that in situations where biological sex does not matter, psychological gender does sometimes matter. Conceivably, therefore, psychological gender may be related to knowledge sharing behaviour even if the latter remains unrelated to biological sex.

Our findings regarding age and professional tenure, both of which turned out not to be related to knowledge sharing behaviour, are counter intuitive: one would have expected older and more experienced individuals to be eager to donate knowledge to younger and less experienced colleagues; conversely, younger and less experienced teachers were expected to eagerly engage in knowledge collecting. The results obtained in this study may be due to the fact that regardless of their age and professional tenure, teachers tend to have similar educational levels. For that reason, they may all feel that they possess the same level of expertise, and thus have little motivation for knowledge sharing, be it donating or collecting. Furthermore, a lot of the expertise they might require access to is likely to relate to subject content (e.g. Newton's Third Law of Motion for Physics teachers) that can be obtained from books and other information sources without the knowledge seeking individual necessarily having to consult other colleagues.

Knowledge sharing was negatively – albeit weakly related to organisational tenure. This is rather worrying because it suggests that the longer teachers stay at a particular school, the more unwilling they become to share knowledge. A possible explanation for this might be that when teachers initially arrive at a new school, either as new recruits or on transfer, they eagerly share knowledge with their colleagues as they try to find their way around the new environment. In time, however, the enthusiasm for knowledge sharing dies down because of a lack of reciprocity on the part of other colleagues, or because of the feeling that knowledge sharing in general is not valued.

Conclusions & recommendations

This study investigated the relationship between knowledge sharing behaviour and four demographic variables, namely, gender (biological sex), age, organisational tenure and professional tenure. Contrary to the postulated hypotheses, gender, age, and professional tenure were not related

to knowledge sharing behaviour, whilst organisational tenure only weakly negatively correlated with knowledge sharing behaviour. Thus, demographic variables do not appear to play any significant role in relation to knowledge sharing behaviour. Nevertheless, given suggestions from the literature that demographic variables do influence knowledge sharing behaviour, it is recommended that further research into the relationship between knowledge sharing behaviour and demographic variables amongst schoolteachers be prosecuted. Future studies should be more comprehensive in terms of the schools and teachers targeted, and also consider the role of other variables, such as a conducive working environment, that might influence how demographic variables interact with knowledge sharing behaviour.

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Authors' competing interests

The authors declare that they have no financial or personal relationship(s) which may have inappropriately influenced them in writing this paper.

Author contributions

This study was part of a doctoral study undertaken by Isaac Mogotsi (first author) under the supervision of Prof. Boon (second author) at the University of Pretoria. Dr Fletcher (third author) provided invaluable statistical input to the study.

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