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*Student exposure to knowledge sharing processes during
work-integrated learning*

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INTRODUCTION

It is generally accepted that the purpose of higher education is to prepare students or learners to perform effectively and efficiently in the complex world of 'work'. It is assumed that 'work-integrated learning' or WIL should prepare a student for the social, professional and working environments that they will enter after successfully attending an institute of higher education. Furthermore, work practices can only be learned through the experience of practising with other practitioners. It is in this context that Raelin (2007:499) identifies the following building blocks of a so-called epistemology of practice:

- Critical reflection: the thinking capacity to make sense of practitioners' own practice and experiences; the ability to think about how their actions resulted in a particular outcome.
- Mastery: developed through an appropriate apprenticeship in which the novice is exposed to multiple practices.
- Extensive use of tacit knowledge: the tacit (intangible) thinking processes that practitioners use as they solve problems and challenges of daily practices.

The third element forms the focus of this paper, namely that as we introduce through WIL the student to the practical activities within an organisation, they should also become acquainted with the knowledge generation processes within an organisation. This does not entail knowledge management as such, but implies the ultimate practice as can be found in the term *knowledge sharing*.

Effective knowledge sharing has developed into an important priority to enterprise, not necessarily because of the importance of knowledge to knowledge workers, but because of the increasing acceptance that tacit knowledge adds more value than explicit knowledge to the innovation process (Marouf 2007:11). There is general consensus that of the many resources an organisation may apply, knowledge is accepted as a key differentiator, therefore crucial to any organisation's competitive advantage.

Knowledge creates knowledge when it is shared with co-practitioners. This paper is therefore an effort to

- Identify the features of knowledge and knowledge sharing (with special emphasis to tacit knowledge)
- Indicate the requirements within an organisation for knowledge sharing to be successful
- Investigate the tools that has recently come to the fore with which knowledge can be shared effectively.

WHAT HAS CHANGED?

It is reasonable to ask the question 'Why this sudden interest in knowledge sharing in the organisation, if knowledge as a phenomenon is nothing new'. The answer lies in the evolution of the traditional Web (1.0) into the now infamous Web 2.0 and which has brought about functionalities that can substantially enhance knowledge sharing. The latter (2.0) is nowadays synonymous with terminology such as social networking and social networking tools. In this context Schneckenberg (2009:510) summarises the vast new functionalities of Web 2.0; from these one could easily conclude why they are so important to knowledge sharing:

- It represents a paradigm shift in which most users assessing the Web's portfolio of emerging tools for mutual interaction and collective creation of knowledge.
- Adoption rate of Web 2.0 tools is high as they are easy to use and intuitive; they enable direct and immediate electronic publication and distribution of content.
- Web 2.0 technologies are changing the interaction processes of both organisations and knowledge workers. Whereas content provider companies in Web1.0 pushed generalised content towards users, its successor provides for selected content to be pulled via aggregation tools such as RSS feeds into their own learning environments. This now represents a collaborative model where users produce more content, retrieve personalised information and then exchange knowledge in distributed environments.
- The new platform is a powerful lever for knowledge workers' desire to build and keep knowledge-based relationships in dispersed social communities.
- The concept of 'friends of our friends' have become a reality in Web 2.0 context. Social network services (SNS) such as LinkedIn and Facebook emphasise the desire to be connected. These communities of practice are being built upon the notion of a sense of communalism, openness and equal opportunity to express one's own thoughts on the shared practice.

These developments also emphasise the emergence of corporate knowledge within Enterprise 2.0, which is using Web2.0 technologies within the enterprise. For the first time employees in corporate context are now in the position to generate and exchange knowledge in collaboration with colleagues. These open and informal platforms can now be perceived as functionalities that enable open collaboration as well as the exchange of information and knowledge within the enterprise, between them, as well as with their partners and customers (Schneckenberg 2009:512). The informal way as well as simplicity to use social network services is thus a powerful and innovative feature of

Web 2.0. This reality strongly emphasises the major shortcoming of the traditional Web, where information systems was both channelled and static; e-mail is a good example in this regard: information is channelled to only certain recipients, with the result that information is either duplicated or perceived as irrelevant by a recipient.

In the long run, knowledge sharing is made easy by the fact that knowledge workers are introduced to corporate platforms and services that are familiar to them via social networking facilities provided by the examples mentioned above (see LinkedIn, Facebook).

CRITICAL DEFINITIONS

Before knowledge sharing applications is discussed, important knowledge-based terminology should be explained to enable us to better understand the processes involved when exposing a WIL student to the world of knowledge sharing.

Knowledge

It is accepted that knowledge is derived from information, and that information is derived from data. As such, knowledge is the most strategically important of an enterprise's resources. Furthermore, knowledge is the result from organizing data into meaningful forms; it is the result of interpreting information based upon the knowledge worker's understanding, thus influenced by the personality of its holder since it is based upon judgement and intuition (Al-Alawi, Al-Marzooqi & Mohammed 2007:24).

However, it is also a generally accepted fact that the knowledge worker plays an important part in transformation information into knowledge; the latter implies a level of understanding obtained by means of experience and personal learning. As long ago as 1995 Nonaka and Takeuchi (as quoted by Hall 2001:21) distinguished two types of knowledge: explicit and tacit knowledge. Without exploring the detail of these concepts some comments have to be made with regard to their features, especially as it impacts on possible student exposure to the organisation's knowledge base during WIL sessions. Amongst the views and definitions of various authors, the summaries by Joia 2010:412 and Hall 2001:21 are cite here, as it is outside the scope of this paper to go into the detail of these definitions:

- Explicit knowledge:
 - ✓ Codified into something formal, structured and systematic
 - ✓ Objective
 - ✓ Often written down
 - ✓ Shared, thus communicated with ease
 - ✓ Accessible to other people
 - ✓ Always flows from human relationships
 - ✓ Visible
 - ✓ Can be stored in external repositories in the form of documents, reports, white papers, presentations, patents, formulas, policy and product manuals, drawings, e-mails.
- Tacit knowledge:
 - ✓ Personal knowledge (resides in the mind of the knower)
 - ✓ Impossible to share without the active participation of the knower

- ✓ Ability or skill to solve a problem which is partly based upon one's own experience and learning
- ✓ Subjective and known only to the individual
- ✓ Highly personal and difficult to formalise
- ✓ Based upon actions and experiences of the individual
- ✓ If expressed, it can take the form of analogies, metaphors, stories or personal strategies of the individual.

To summarise, the following interaction features are typical of tacit knowledge (Holste and Fields 2010:130):

- Face-to-face interaction is often the primary method for sharing tacit knowledge.
- Levels of risk and uncertainty typically associated with tacit transfer are reduced by trust in relationships (see the topic of trust in an enterprise below).
- Key to formal and informal tacit knowledge transfer is the willingness and capacity of individuals to share what they know.

For those who want to probe further into this matter, a detailed outline of the writing of various authors about tacit versus explicit knowledge is to be found in an extensive table compiled by Holste and Fields (2010:130).

To conclude this section one has to emphasise that Web 2.0's social networking and social media developments have not only resulted in a more effective and productive tacit knowledge sharing but will also have a major influence on WIL.

Knowledge management

A knowledge management system provides for both tacit (uncodified) and explicit codified knowledge to be created, stored and shared with ICT technology (Harlow 2008:150). The following list of critical knowledge processes is summarised by the same author:

- Generation of new knowledge
- Accessing valuable knowledge from outside sources
- Using accessible knowledge in decision-making
- Embedding knowledge in processes, products and services
- Representing knowledge in documents, databases and software
- Facilitating knowledge growth through culture and incentives
- Transferring existing knowledge into other parts of the organisation
- Measuring the value of knowledge assets, thus the quality of the organisation's knowledge management.

Suppia and Sandhu (2011:464) list a number of relevant sources to conclude that knowledge management describes the following activities:

- Managerial and administrative processes of knowledge management, which can include the following:
 - Knowledge assessment
 - Knowledge acquisition, absorption and assimilation
 - Knowledge creation, processing, development, transformation
 - Knowledge storage and retrieval
 - Knowledge sharing, distribution, circulation, transfer

- Knowledge utilisation, application.

Most if not all of these processes entails both tacit and explicit knowledge. Furthermore, traditional knowledge management emphasised technology or the ability to build systems that efficiently process and leverage knowledge. The new mode of knowledge management involves people and actions (Al-Alawi, Al-Marzooqi & Mohammed 2007:24); its main purpose is therefore to create an environment where power equals sharing knowledge rather than keeping it.

The emphasis in this paper is therefore on the question of how to expose a student in WIL to experience the sharing of (intangible) tacit knowledge. The ways and means in creating such an experience can be better understood by studying the critical success indicators associated with the transfer of tacit knowledge (Joia 2010:413-416):

- Individual management of time: Experience, reflection and dialogue take time for the sharing (exchange) to be experienced and reflected upon. As indicator it shows whether knowledge workers have enough time to share their tacit knowledge.
- Common language: A prerequisite for communication between receiver and source of tacit knowledge is a common terminology, including jargon. Furthermore, being stored in non-verbal format, people can be unaware of the knowledge they possess or even incapable of expressing the obvious, irrespective of how qualified or experienced they are. This indicator ensures that knowledge workers in an organisation have the ability and (technical) opportunities to express the tacit knowledge they have acquired.
- Mutual trust: A relationship of trust must prevail between individual people within an organisation. The greater the trust between individuals the lower the risk of uncertainties in tacit knowledge sharing will be. This indicator implies the level of trust among individuals facilitating tacit knowledge sharing within the organisation.
- Relationship network: The form of communication within a company depends on the internal relationship network. This is essential to establish who possesses the knowledge and who might be interested in such knowledge. This indicator aims to discover those colleagues who have the knowledge that is needed, as well as bringing them in touch with those that might need such knowledge.
- Hierarchy: It is common knowledge that bureaucratic factors can obstruct an organisation's knowledge sharing processes. Formal structures and control systems can clearly hinder what individuals are allowed to do; this creates barriers in the way of effective knowledge flow and sharing. This indicator refers to the accessibility of people who possess and share tacit knowledge notwithstanding their hierarchical position.
- Reward: Rewarding implies encouraging knowledge workers to share their knowledge appropriately and upon demand (when needed). Although debateable, the relevant indicator is one that can establish if a reward system is in place for those that often and willingly share their tacit knowledge among its members.

- Type of training: New employees and the transfer or promotion between various sections necessitates proper training. This is typically done by formal classes, consisting of presentations by instructors and supported by documentation such as notes on rules, procedures and processes. These mainly support sharing of explicit knowledge. The relevant indicator in this regard refers to the extent to which an organisation also make provision for more tailored strategies based upon personal contact such as coaching and mentoring, which obviously demands more time.
- Knowledge storage: This is a demanding aspect to prioritise as investment in information technology is not appropriate for explicit knowledge sharing (eg investments in sophisticated database systems). Tacit knowledge sharing invests in the accumulated experience of its employees, as knowledge is directly related to the person who developed it. This indicator will establish to what extent organisational knowledge is effectively stored in its people.
- Power: The possibility of loss of power of those who share willingly what they possess is a well-known phenomenon. 'Knowledge is power' is contradicted with sharing as it can mean loss of influence, superiority professional respect and even job security. An important indicator is thus an analysis of the knowledge with regard to it as a source of power within the organisation.
- Internal level of questioning: Employees who get to know each other develop a relationship of trust among themselves, therefore can deal better with conflicts and differences, thereby enriching corporate knowledge. In this context the critical indicator should be the level of questioning and criticism tolerated within an organisation.
- Type of valued knowledge: Some forms of tacit knowledge such as intuition and personal skills are sometimes not considered of value by traditional organisations and their workers. This is a barrier that can prevent the sharing and building of tacit knowledge within an organisation. This is contradictory of what is generally accepted in the modern enterprise, namely sharing of personal tacit knowledge. A knowledge sharing indicator should therefore be to establish the acceptance of by employees of suggestions and ideas that are not supported by data and facts.
- Media: Choice of media used by an enterprise can contribute to tacit knowledge transfer. Personal communication, demonstration of personal skills and even body language is regarded as 'rich' ways of communication, in contrast with explicit knowledge where immediate feedback is invariably not possible. Establishing the most commonly used ways of communication between employees is the indicator for effective tacit knowledge sharing.

The above-mentioned indicators will be revisited towards the end of this paper, as most of the indicators can play a role to establish an environment in industry (workstations) which has the potential to expose a student to a knowledge sharing experience. Furthermore, Web 2.0 technology and its associated tools bring about a new approach or model namely KM 2.0, which represents an effort to harness the collective intelligence of a company through formal and informal communication by making use of social networking and social media (Razmerita, Kircher & Sudzina 2009:1033).

Knowledge sharing

As said above, the purpose of this paper is to emphasize the necessity to undergo quality experience in industry with regard to knowledge sharing. The latter is the main outflow or result of effective albeit informal knowledge management in the typical small and medium enterprise. As with the other essential key terms or concepts as discussed above, the term *knowledge sharing* was and still is being scrutinized. Herewith a selected number of definitions, selected to be relevant to the knowledge sharing experiences during WIL:

- Knowledge sharing is the act of an employer dispersing his/her obtained knowledge and information to other colleagues within an enterprise (Ryu, H & Han 2003)¹ as quoted by Lin, Hung & Chen (2009:930).
- Chua (2003:118) defines knowledge sharing as the process by which individuals collectively and iteratively refine a thought, an idea or a suggestion in the light of experiences.
- Knowledge sharing is a process of communication between two or more participants with regard to the provision and acquisition of knowledge (Lin, Hung & Chen 2009:930).
- Knowledge sharing is more than transferring information; it is instead the provision or receipt of task information, know-how- and feedback about a product or procedure (Mueller 2012:4).
- To conclude, it can therefore been said that knowledge sharing requires that a person first share knowledge to others, thereafter the group achieves mutual benefits.

Some challenges would be addressed if an organization plans to fully incorporate knowledge sharing in a WIL situation. Possibly the most important reason is that tacit knowledge, the subject for sharing is intangible and as seen in the previous list, sharing occurs specifically between two individuals or within a group.

Knowledge sharing and organizational culture

There is sufficient evidence in the literature tacit knowledge sharing is dynamically linked or attached to the people in the organization. These can be the employees, the leaders and the managers of enterprises. Furthermore, quite a few studies have been published on the influence of organizational culture on the quality of knowledge sharing; see for example Figure 1 for a useful model as developed by Suppiah and Sandhu (2011:466).

The fundamental departure point of the model is that ‘...the various dominant culture types influence tacit knowledge sharing behaviour differently – some positively and others negatively (Suppiah & Sandhu 2011:466). For establishing an efficient WIL environment with regard to organization culture, it is therefore essential to identify the culture types present in an organization; Figure 1 classifies them as follows (pp 467):

1. Clan culture: a friendly environment where people share a lot about themselves; typical features are teamwork, employee involvement programmes, high employee commitment to enterprise and fellow workers, as well as high corporate commitment to employee.

¹ Rya, S., Ho, S.H. & Han, I. 2003. Knowledge sharing behaviour of physicians in hospitals. *Expert Systems with Applications* 25(1):113-122.

Result: clan culture has a positive influence on tacit knowledge sharing.

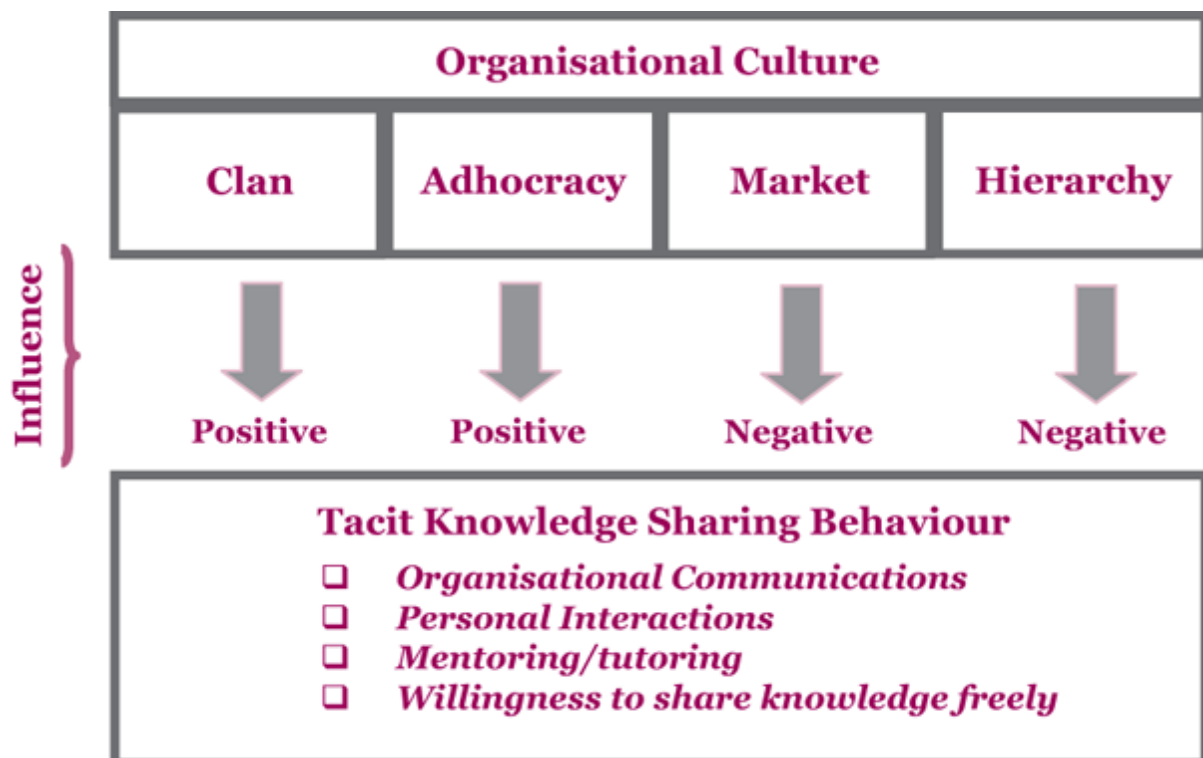
2. Adhocracy culture: generally organic and characterised by a dynamic , entrepreneurial and creative workplace. Knowledge workers are empowered and taking risks is encouraged. Leadership is innovative and risk-orientated.
Result: has also a positive influence on tacit sharing.

3. Market culture: major focus of this culture is to conduct transactions with other stakeholders to develop competitive advantage. Competitiveness and productivity is the foundation of such a market culture. Also: winning is everything in a market culture. Knowledge therefore becomes a proxy for power.
Result: has a negative impact on tacit sharing behaviour.

4. Hierarchy culture: characterised and multiple hierarchical structures, with a minimal powers vested in employees.
Result: has a negative influence on tacit knowledge sharing behaviour.

5. No dominant culture type: two or more cultures may appear simultaneously.
Result: depending on the combination: if negative culture then a negative influence will avail; opposite also true.

Figure 1: Theoretical model illustration the potential influence of organisational culture on tacit knowledge sharing (Suppiah and Sandhu 2011:466)



Culture types 1 and 2 are therefore strongly recommended for WIL; research is still necessary to establish how to select these two types for work-integrated learning.

Furthermore, it is a reality that the 'younger generation' are already using tacit knowledge sharing tools via the Web – albeit intuitively they expect them to be available in the workplace, and secondly they find it natural to use (Levy 2007:129). They are by now well-equipped for Web 2.0 and Enterprise 2.0 functionalities to be implemented in the corporate environment.

To conclude this section the work by Holste and Fields (1020:129) on trust and tacit knowledge sharing is of the utmost importance. They argue that the willingness of employees to share and use tacit knowledge may depend on the extent that knowledge workers are trusted recipients and sources. Although untested, this may just as well lead to the conclusion that trust *per se* would experience greater visibility in the clan and adhocracy culture groups mentioned above.

Typical knowledge sharing technologies

Formal and industry-based knowledge sharing technologies or knowledge sharing enablers can add tremendous value to an enterprise (Hedgebeth 2007:49). The same author also identifies six categories of KM technologies, such for collaboration, mobile work, content management, business intelligence, business process management, as well as for knowledge sharing. Research is still to be done, but it is only logic to argue that these formal company-wide and industry-based technologies will soon gave way for a much more informal social networking and/or social media approach. Again, the younger generations will demand a type of corporate Facebook or similar network system. In this context Gotta made some inroads in reporting on his empirical work (2009:10). He founded *inter alia* that wikis might be an important option for building a community or type of virtual community site. The latter is a common starting point and might be a huge knowledge sharing asset in the corporate years to come.

Although there are an increasing variety of Web 2.0 services available, some of them can support tacit knowledge sharing in a WIL environemt better than others. The following represents a basic list of possibilities with a brief interpretation of each potential role to enhanceWIL (Van Zyl 2009:908; Dickson 2010:471; Levy 2009:124; Razmerita 2009:1028-1029; Grace 2009:64-66):

- Really Simple Syndication (RSS): A web feed used to publish frequently updated content.
- Tagging: Use of keywords to track contents on websites; this can be seen as a form of social bookmarking where a reader can gain access to content identified by other users.
- Social bookmarking: a system that allows readers to post their lists of bookmarks or favourite websites for others to search.
- Wikis: These can be described as a type of website that allows collaboration from multiple readers who are permitted to edit a particular section's content. More specifically, a wiki is a collection of contributions sharing the same templtles.

- Blogs: Blogs are a self-publishing tool where the owner can periodically add content; readers can subscribe, link to it, share links and even add to the content. In other words, blogs are web pages consisting of user-supplied content in chronological order. Many students have already created and are maintaining their own blogs for various reasons, for example as a personal diary.

The next section will deal with decisions to be made to with regard to selecting applicable workstations for WIL-related knowledge sharing.

CONCLUSION

The purpose of this paper was to introduce the importance of tacit knowledge sharing in an organisation or specifically the enterprise. Secondly, Web 2.0 social media looks like the ideal activator to improve sharing activities within the said organisation.

It can be recommended that this subject area should become a high priority in the WIL approach to practical teaching and learning. Research is therefore needed to establish how Web 2.0 technologies will result in the best knowledge sharing experiences in WIL, and secondly what are the critical indicators for WIL workstations. These are briefly discussed below.

Wikis: It has been indicated above that Web 2.0 might provide answers to questions with regard to how an enterprise should be structured to enhance knowledge sharing. Also, how they have been managing their knowledge assets by tapping into expertise of their own employees, suppliers and customers. By maintaining an enterprise Wiki, a student can tap into and take part in knowledge sharing whilst busy with a WIL programme. As indicated above a Wiki is an open accessible community of users responsible for its own content creation and communication.

Critical indicators for WIL workstations: Possible organisations or workstations are typically evaluated for providing good learning experiencing during the WIL phase. From some indicators should be valuable to use to enable the WIL coordinator to select the best knowledge sharing organisations possible. From Jola's discussion of indicators the following could be explored further for this purpose (2010:413-416); take note that not all of these would be relevant to WIL needs:

- Individual management of time (whether knowledge workers have enough time to share their tacit knowledge).
- Common language (that knowledge workers in an organisation have the ability and (technical) opportunities to express the tacit knowledge they have acquired).
- Mutual trust (high level of trust among individuals facilitating tacit knowledge sharing within the organisation).
- Relationship network (knowing those colleagues who have the knowledge that is needed, as well as bringing them in touch with those that might need such knowledge).

- Hierarchy (accessibility to people who possess and share tacit knowledge notwithstanding their hierarchical position).
- Reward (establish if a reward system is in place for those that often and willingly share their tacit knowledge among its members).
- Type of training (organisations which also make provision for tailored strategies based upon personal contact such as coaching and mentoring).
- Knowledge storage (establish to what extent organisational knowledge is effectively stored in its people).
- Power (analysis of the knowledge with regard to it as a source of power within the organisation).
- Internal level of questioning (level of questioning and criticism tolerated within an organisation).
- Type of valued knowledge (acceptance of by employees of suggestions and ideas that are not supported by data and facts).
- Media (wide level and types of communication between employees indicates effective tacit knowledge sharing).

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