

MANAGING INFORMATION FOR WORK- INTEGRATED LEARNING AT HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

Higher education institutions (HEIs) in South Africa require teaching and learning to include work-integrated learning (WIL) within specific learning offerings. The different learning options provided by various faculties have unique and diverse procedures which justify different WIL approaches at HEIs. A lack of structure regarding the information management (IM) for WIL across departments results in different processes being followed, which can impact negatively on the optimal utilisation of WIL. Frameworks for IM for WIL, however, have been developed at international HEIs. Using a qualitative approach and phenomenological research design and working with these frameworks as well as the Theory of Motivated Information Management, the researchers collected data using semi-structured individual interviews and group discussions from the University of Cincinnati (UC) and the Northwestern University (NWU) in Illinois, United States (US). This article presents the findings of an IM framework from these two US universities. After research was conducted at a South African university, a conceptual framework was developed for the IM for WIL based on the framework from the international universities that may be implemented at HEIs in South Africa. With time this framework could be

tested in a number of settings that could lead to the development of a model for IM for WIL in the South African context. The article, however, reports on the findings of the two international universities only and the conceptual framework requires further testing and validation before it can be published.

KEYWORDS

work-integrated learning, information management framework, higher education institutions, information management

1 INTRODUCTION

Work-integrated learning (WIL) or cooperative education (Co-op) is not a new concept as it emerged in the early 1900s. Herman Schneider launched Co-op or WIL in 1906 at the University of Cincinnati (UC) in the United States (US). His plan to bridge the gap between theory and practice was based on an idea that was right for its time. He was an engineering professor, later an engineering dean and university president at UC (Sovilla & Varty 2011:3). He became convinced that in order for students to understand and master the many professional concepts and skills that they have learned in the classroom, practical experience is required. In 1938, John Dewey, one of the founding fathers and developers of experiential learning, indicated that a given experience is the result of an interaction between that which students bring to a given situation and what happens there (Chisholm, Harris, Northwood & Johrendt 2009:326). This concept is further supported by the notion that students learn through their actions rather than through the actions of their lecturers (Walsh 2007:79). WIL is, therefore, a multi-disciplinary approach based on four individual components, namely: the foundation of experience; reflection; abstract conceptualisation; and application (Chisholm et al 2009:326).

WIL is critical in empowering students to be aware of what is expected of them in the workplace and allows them the opportunity to experience real work environments. According to Martin and Hughes (2009:8), WIL experiences provide a bridge for students between the academic present, and their professional future, and are an opportunity for the students to apply and merge the theoretical knowledge gained in academic studies with 'real world' work place practical experiences. The key purpose of WIL is providing graduates with the comprehensive skill-set desired by potential employers (Coll et al 2009:15). WIL is based on information management (IM) principles where each of the parties involved has a unique and critical role to play in order to deliver effective graduates who are suited to specific work circumstance (Abeysekera 2006:8). According to Spowart (2006:11), HEIs are under increasing pressure to prepare their graduates for the world of work by including a component of WIL. The knowledge gained through the WIL process is made up of three different fields, namely: the academic field; the

educational field; and the professional practice field (CHE 2011:9). Clear linkages between these fields are designed to benefit student learning.

Figure 1 shows a WIL process of how knowledge is exchanged and built on the boundary-spanning applied concept. The academic staff do research and develop curricula for specific programmes. In order to complete this curriculum development cycle of research, the academic staff consult with industry partners as part of the professional practice stage in Figure 1. The dotted line in Figure 1 shows that there is not a rigid separation between the academic and professional elements of WIL. The shaded areas in Figure 1 show that the focus of WIL is on professional-oriented education, based on the needs of industry partners.

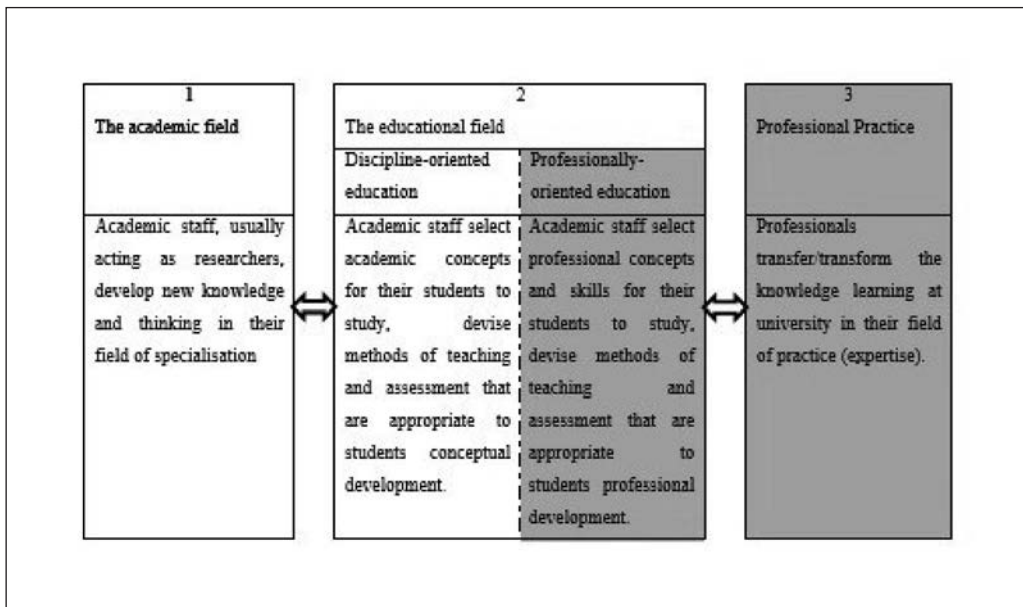


Figure 1: A professional knowledge system in WIL approach (CHE 2011:9)

There must be a clear linkage between the three fields shown in Figure 1, which corroborate the importance of boundary-spanning. The boundary-spanning concept will be well founded if the links between the three fields in Figure 1 are working optimally. The rationale behind this school of thought is ensuring that the correct concept is applied, to allow for a well-developed and effectively working IM process for WIL. The goal being strived for is to ensure that the triad partners share all the relevant information. This is done to ensure that the process, which prepares students for deployment at industry level on graduation, does work. It is critical to ensure that the focus is on graduates' employability by providing well-prepared academic individuals, who would enhance the employment milieu; therefore, it is important to make use of boundary

spanning. Boundary spanning is a concept developed and used in organisational theory but is rarely used to understand organisational structures in higher education.

Boundary spanning brings a fresh perspective to the question of the transfer of knowledge and skill between education and work and can build a clear linkage between the three fields as shown in Figure 1. According to Pruitt and Schwartz (1999), boundary spanning links organisations to one another in order to create mutually beneficial relationships. Peach, Cates, Baden-Wuerttemberg, Jones and Lechletter (2011:94) argue that the boundary spanning activity has the capacity to help HEIs respond to demands for continuous quality improvement and to increase their capacity to react to environmental uncertainty. Boundary spanning therefore allows HEIs to perform better and respond to increased demands based on environmental uncertainty and demands.

Smith and Smith (2010:2) and Bates (2005:1) confirm that WIL is a partnership between three major participants, namely: the student, the industry mentor as well as the HEI lecturer. Costa (2009:37) agrees that the three parties must work together to produce graduates who are more ‘work-ready’. The demand for relevant workplace skills of new graduates and potential employees has increased over the years, as the linkage process between practice and academia has improved (Wei, Siow & Burley 2006:125). This in turn underpins successful IM for WIL provision which should not be misunderstood as a loose association of cooperation. The relationships between the tri-part groups have to be strengthened and promoted at all times. In order to illustrate the dynamics of the tri-part groups involved in the WIL process, Figure 2 has been developed.

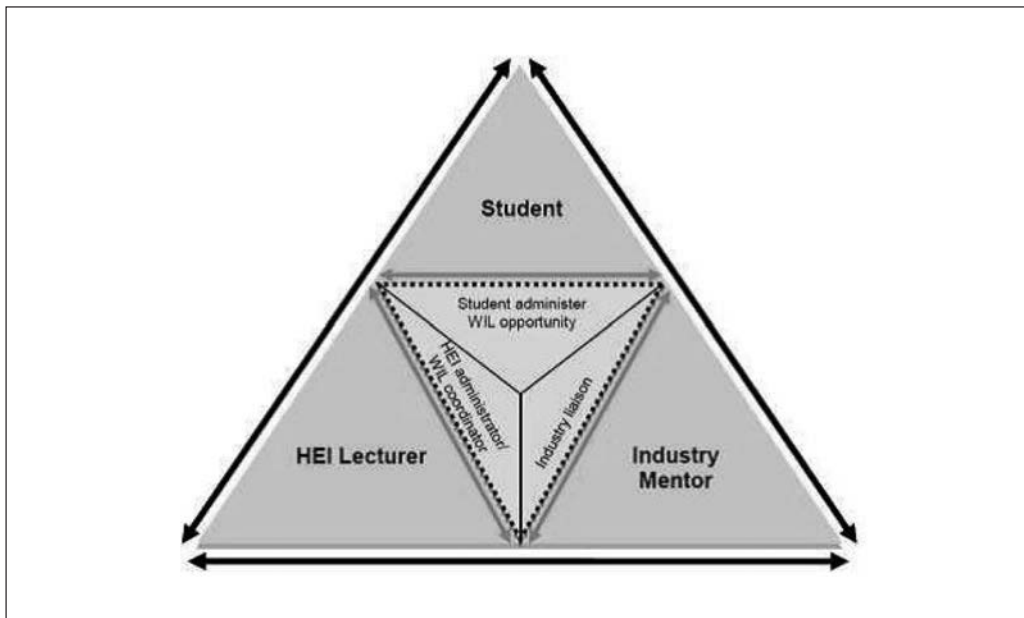


Figure 2: Roles and responsibilities of triad partners considering boundary spanning (own source)

It is crucial that all three parties engaged in the IM for WIL process are committed, and understand their functions, roles and contributions, which are worth the effort and the potential conflict that might ensue. The triad partnerships in Figure 2 underpin work-related programmes as they all have a role to play in creating environments where boundary spanning is understood, valued, and made possible so that benefits are distributed (Peach et al 2011:100). In Figure 2, the outside triangle is the *educational purpose* triangle of WIL and the partnership is between the student, the HEI lecturer and the industry mentor. The *educational purpose* for the student is to apply the theoretical learning that has been gained by lectures at the HEI in the industry setting under the guidance of an industry mentor. The result of the educational purpose of WIL is to develop the student's practical application of the theoretical learning under the supervision of an industry mentor according to agreed HEI outcomes.

The inside triangle is the *administration purpose* that focuses on the management of any information exchanged within the WIL process. Here, the partnership is between the student, the HEI administrator/WIL coordinator and the industry liaison. In an HEI environment, the administrator/WIL coordinator and the HEI lecturer can be the same person and the industry liaison and the industry mentor can be the same person. The student and the student administrator is always the same person due to the student needing to manage his/her own personal information. At the same time, the student is responsible for managing any information that is required from him/her within the organisational information management perspective within the administration purpose (inside triangle of Figure 2). This triangle in Figure 2 is the foundation of an effective and sustainable WIL programme. Effective WIL is largely reliant on the managing of information gained by the three parties involved. According to Smith and Smith (2010:3), a successful partnership requires collaborative self-interest and transparency that is explicit about what all partners want and expect from the outset and how they will pursue this. Smith and Smith (2010:3) further argue that it is only by establishing strong collaborative partnerships between the HEI administrator/WIL coordinators, a suitable industry liaison and those students who will benefit from the integrated learning experience, that such partnerships can enable WIL programmes to be effective and sustainable in the longer term. It is clear that the relationships between the triad partners have to be strengthened and promoted at all times to have an effective IM for WIL (Li & Randhawa 2009:1003). This study focused on the management of information primarily in the administration of the WIL process (the inside triangle of Figure 2) to ensure that the educational intent of the WIL process (the outer triangle in Figure 2) can take place effectively.

2 INFORMATION MANAGEMENT OF THE WORK-INTEGRATED LEARNING PROCESS

An HEI within specific learning offerings requires that teaching and learning includes WIL. Often, a lack of structure regarding the WIL process across departments functioning in silos, results in diverse processes being followed for the WIL component, considering that departmental requirements differ. The different learning options provided by various faculties also have unique and diverse processes which justify the different WIL processes in the HEI. The administration of the IM in each faculty is different. According to Powell (2003:55), IM ensures that information of lasting relevance is recorded and placed in a well-structured organisational archive. A lack of structure for IM can impact negatively on the optimal utilisation of the administration of the WIL process. Hence, the focus of this article is on the findings regarding an IM framework from two international universities in the US, focusing on an effective feedback process for IM for WIL. According to Cates and Cedercreutz (2008:28), a feedback process will allow the three parties involved an efficient allocation of educational resources. In order to establish an effective feedback process, the information that currently is, and that potentially could be exchanged between the HEI, the industry partner and the student needs to be managed. The results from the question: ‘How does the US HEI handle the administration of the WIL process in terms of IM?’ provided the data for the development of the conceptual framework that requires further testing at a South African HEI for the IM for the WIL process.

3 RESEARCH DESIGN

A qualitative research design was used in the study. Qualitative research aims to understand phenomena in context-specific settings, such as a ‘real world setting, where the researcher does not attempt to manipulate the phenomenon of interest’ (Patton 2002:39). According to Strauss and Corbin (2008:13), researchers who engage in qualitative design do so because of the flexible, dynamic and evolving nature of qualitative research as opposed to the less flexible designs used in quantitative research. Strauss and Corbin (2008:12) further argue that by doing qualitative research the researchers are allowed to experience the inner perspective of the participants. They are also able to determine how meanings are formed and can discover rather than test variables.

Phenomenological research emphasises the understanding of the ‘essence of a phenomenon as it is experienced by individuals’ (Clark & Creswell 2010:239). According to Longhofer, Floersch and Hoy (2012:40), phenomenology study structures of conscious experience, as experienced from the first-person’s point of view, within prevailing conditions of experience. The data was collected to explore the involvement

of the WIL coordinator/lecturer, the industry mentor/liaison and the students in the IM of the administration of the WIL process. The WIL coordinator/lecturer, the industry mentor/liaison and the students involved in the WIL process were included in semi-structured individual interviews, group discussions and a survey using open-ended questionnaires. The four academic departments at UC involved in the study were: Civil and Environmental Engineering, Architecture, Construction Management, and Information Systems. At NWU, the three academic departments involved were: Analytical and Bio Analytical Chemistry, Electrical Engineering, and Mechanical Engineering.

The WIL coordinators/lecturers from UC and NWU involved in the IM for WIL process participated in the study which entailed semi-structured individual interviews. Due to the geographic location of students and industry mentors/liaisons who were spread across various states at UC, it was impossible for the researchers to conduct either semi-structured interviews with the industry mentors or group discussions with the students. Therefore, a semi-structured open-ended questionnaire was administered as part of their evaluation report at the end of their WIL term. In total 123 respondents from UC provided data for analysis. Of the 123, four were individual unstructured interviews conducted with WIL coordinators and lecturers and 119 were semi-structured questionnaires completed by students and industry mentors/liaisons. At NWU, three semi-structured interviews with WIL coordinators/lecturers and eight industry mentors/liaisons formed part of a group interview. Four faculty advisors participated in semi-structured individual interviews. Twelve semi-structured questionnaires were returned from students in the participating departments, resulting in a total of 27 respondents in this sample. During the interviews, the IM issues of the administrative processes for WIL were investigated.

4 FINDINGS

The administration of WIL at UC and NWU is carried out as a centralised institution-wide function. The HEI lecturer and the HEI administrator/WIL coordinator for each of the investigated departments at the two HEIs, as shown in Figure 2, is the same person. Therefore, both universities have dedicated appointed WIL coordinators/lecturers per department, at the centralised WIL unit. In their freshmen year (ie, their first year of study), the two mentioned universities prepare their students for the WIL programme which will only start in their sophomore year (ie, their second year of study). The students must complete a minimum of four WIL quarters, although the majority of students complete six quarters (Cates & Cedercreutz 2008:23). At UC, the students are required to remain with the same employer for a minimum of two quarters. At NWU, the students are required to remain with the same employer for the

full period of their WIL deployment, in order to provide a reasonable depth of experience.

In Table 1, the information flow and sources of the WIL process at UC and NWU are depicted. Figure 3 shows the first triad of the information flows of the WIL process at UC and NWU. The process of registering students on the WIL programme is recorded according to each step in which the three parties need to engage. Students are exposed to WIL in their freshmen year; they are briefed on the WIL programme; and awareness of its importance is created. Students are placed in this WIL programme according to the following specified steps with the corresponding responsibilities of any one of more persons in the tripart relationship of the WIL programme. The programme distinguishes between different circumstances which may develop within the student's sphere.

In Figure 3 and Table 1, the process and implied information flow of WIL is discussed. The first cycle of the IM for WIL process as displayed in Figure 3 is explained in Table 1. The first cycle reflects students registering for the first time. The students register for the programme and are sent for training on Curriculum Vitae (CV) writing and interviewing skills. The completed résumés are registered in an electronic system and loaded for use during the WIL appointment process. All related information is hosted on a centrally located repository which records all information related to the WIL process. The central WIL office at the HEI distributes the résumés to the different industry liaisons. The potential employers study the available résumés on the central database and after perusing the available résumés the employers identify the students whom they are interested in placing for the duration of the WIL process. The HEI's WIL department facilitates the interview process between the student and the industry liaison. After the interview the student is informed of the outcome of the interview and upon securing a successful interview with the employer, the

industry liaison provides an appointment letter to the student. This allows the employer to set the terms of employment and may include the projects that need to be completed and evaluation standards that should be achieved. The central WIL office allocates four specific tasks that the student needs to complete during placement with the employer. Electronic forms have been developed and are in place to be completed by the student and the employer after completion of the duty cycle at the employer. These completed forms need to be provided to the central WIL office to reflect the student’s performance. The student needs to make a final appointment with the WIL representative at the HEI to discuss his/her experiences with the employer after completing the placement session.

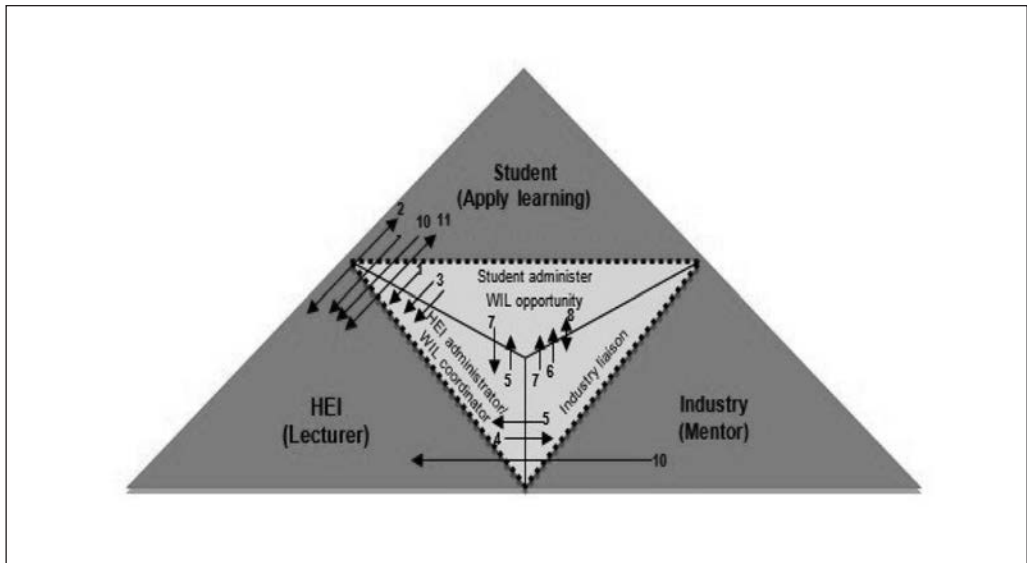


Figure 3: Information flows between the triad partners of the first WIL process at UC and NWU (own source)

Table 1 reflects the corresponding information sources that exchange hands in the triad during the WIL process.

Table 1: Information flow and sources of the WIL process at UC and NWU

WIL Process	Information Flow	Information source
Students register for WIL (→)	Student administer WIL opportunity to WIL coordinator	Registration document for WIL Degree plan for WIL
Students need to attend the training in CV writing and interviewing skills (↔)	Student (apply learning) to student administrator WIL opportunity to WIL administrator to WIL advisor	Soft skills documents: CVs and examples of CVs from WIL advisor. Invitation from HEI administrator/ WIL coordinator
Students write their CVs and submit their CVs on the electronic system (→)	Student administer WIL opportunity to WIL coordinator	Final CVs of students
Centralise WIL division will send out the CVs to the employers (→)	WIL coordinator send CVs to industry liaison	E-mail students CVs to industry liaison
Employers will arrange with the centralised WIL division for an interview day when they will interview the students on campus (→)	Industry liaison to WIL coordinator. WIL coordinator to Student administer WIL opportunity for interview time	List of candidates e-mail to HEI administrator/ WIL coordinator
Employers inform students if they were successful (→)	Industry liaison phone or e-mail to student administer WIL opportunity to inform if they are successful	E-mail from industry liaison to inform students if they were successful
Employers provide students with an appointment letter (→)	Industry liaisons to student administer WIL opportunity. Student administer WIL opportunity send agreement letter to WIL coordinator.	Agreement letter from industry
Students and employers agree on outcomes for their work period and students will be assessed accordingly (↔)	Student administers WIL opportunity to industry liaison. Student administers WIL opportunity to WIL coordinator.	Paper of outcomes for work period
Students need to do assignments on four criteria for the centralised WIL division (→)	Student (apply learning) to Student administer WIL opportunity to WIL coordinator to WIL advisor	Assignments done by students
Employer and student need to complete electronic assessment forms at the end of the work placement about their performances (→)	Student (apply learning) to student administer WIL opportunity to WIL coordinator to WIL advisor Industry mentor to industry liaison to WIL coordinator to WIL advisor	Assessment documents done by industry mentor and students
Students need to make a 15-45 minutes appointment with their WIL advisor, to discuss feedback and experience during placement (↔)	Student (apply learning) to Student administer WIL opportunity to WIL coordinator to WIL advisor	Assessment documents industry mentor and students

→ This arrow represents one way flow of information and information sources from one triad partner to another.
↔ This arrow represents a two way flow of information and information sources between triad partners.

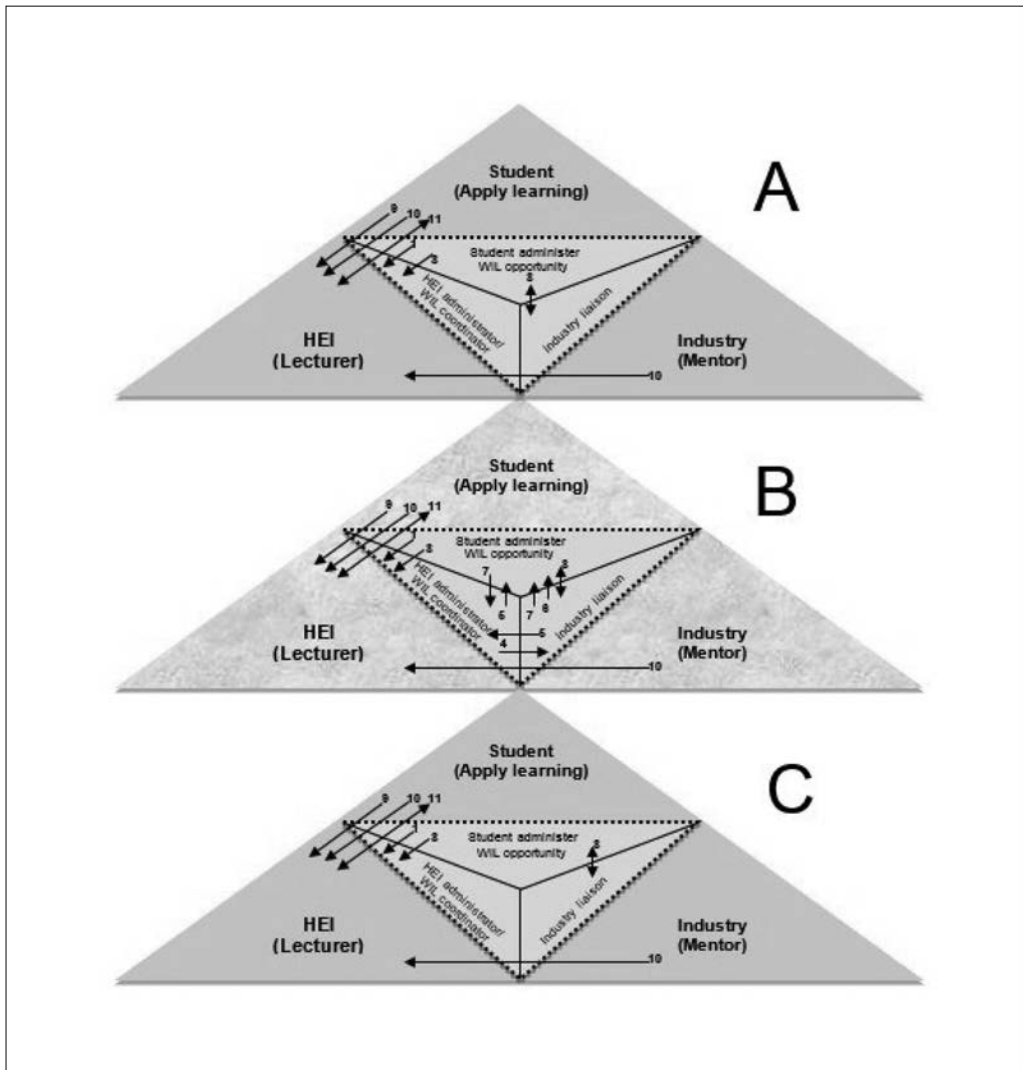


Figure 4: Information flows between the triad partners of the second to the fourth WIL quarters at UC and NWU (own source)

The second to the fourth WIL quarters for the IM for the WIL process are recorded in Figure 4(A) and reflect the process when a student remains with one employer for the full placement period of WIL. Students need to register for every WIL quarter and step one will be repeated at the beginning of each year. Based on students having had a previous registration on the WIL system, the students would be active on the system already and would have provided their résumés which were registered and distributed to different employers. After receiving appointment letters, the students and employers only have to schedule an interview to discuss the expected outcomes during the placement for the

new phase and discuss which new targets need to be achieved, which is represented by step eight as shown in Figure 4(A). The targets and assignments need to be completed using four criteria as required by the central WIL office and electronic assessment forms need to be completed online. Thereafter, interviews take place with a university representative to secure feedback on the session with employers and what results have been achieved. This process is repeated from the second year to the fourth year during the student's study period.

In Figure 4(B), the student who has been registered on the WIL system and already provided the required résumé represents a student that is experiencing difficulties and needs to make changes with regard to the employer. This requires changes that start from step four when the students' résumés are sent electronically to the employers. Should a student need to make changes regarding an employer, a new interview with the new employer should be conducted. Should the student be successful and have difficulty with the four assessments required by the HEI lecturer, it needs to be addressed with the employer. The system allows changes to be made and the student is able to address these issues with the tri-part group, namely the student representative, the employer, the representative and in the end the entire WIL cycle. This allows changes to the system when students have difficulties. This capacity to accommodate such changes in turn reflects that the system is practical and user friendly. If students change employers during the WIL placement quarters, the IM of the WIL process will display another triad as shown in Figure 4(C). The steps in this triad show a repeat of what has taken place in Figure 4(A). Figure 4 reflects the administration of what is involved in the IM for the WIL process. The complexity of the process and the associated information flows and relevant sources find parallels with the Theory of Motivated Information Management (TMIM). Afifi and Weiner (2004:183) state that the one unique feature of the TMIM is the direct acknowledgment of the role played by information providers in the IM process (see Figure 5). The TMIM brings together the diverse findings related to 'uncertainty management in interpersonal encounters, explicate the role of efficacy in the process and offer a framework that explicitly recognises both the information seeker and information provider in the exchange' (Afifi 2010: 96).

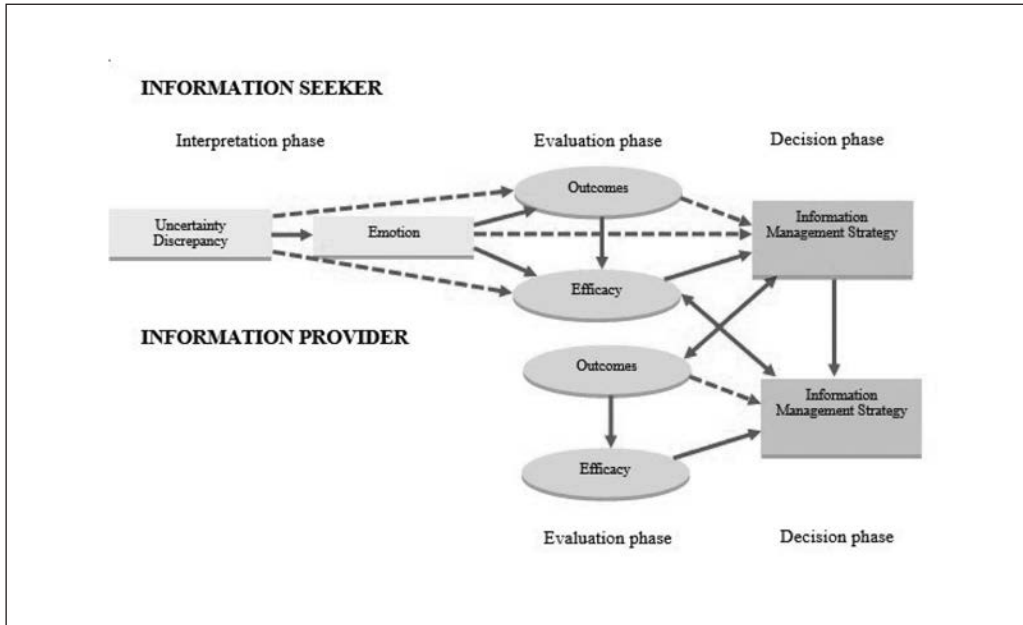


Figure 5: In the TMIM, the dashed lines reflect paths that are partly mediated by other variables with which the relevant variables have associations (Afifi & Weiner 2004:172)

As seen in Figure 5, the TMIM is represented by three phases. The first phase of this theory is the *interpretation phase*, where the WIL liaison will make the students and industry *aware* of the important issues and the anxiety or emotions that they will have about the WIL process and what needs to happen. The second phase of this theory is the *evaluation phase*, which reflects expectations about the outcomes of the WIL. In order for the WIL to be effective it is important for all parties involved to know what is expected of them and what the outcomes must be. The TMIM propositional framework applies only where individuals are actively interested in managing information and intentionally engage cognitive and other resources toward obtaining the end (Afifi 2010:96). According to Afifi and Weiner (2004:172), the IM process must begin with an untangling of uncertainty. If the WIL partners are uncertain about anything, emotions will appear that will have an influence on the *evaluation phase*. During the decision phase, the existing IM for WIL framework at the two HEIs in the US would be evaluated.

Any one of the triad partners acts as either the information seeker or the information provider during the sequence of the WIL process as described in Figures 3 and/or 4. WIL is a three-way communication process which places the students sometimes in an information provider role and sometimes in an information seeker role. A number of feedback loops are necessary to administer the support needed for the educational intent of the WIL process to be successful. Good feedback is needed to provide the

student's perspective of his/her experience of the WIL process undertaken at the industry employer.

The frameworks embody the recognition that in order to establish an effective IM feedback process the information that currently is, and that potentially could be exchanged between the HEI, the industry partner and the student needs to be managed. This relationship is referred to as the three-spary relationship. Effective WIL is largely reliant on the managing of new information gained by the three parties involved. Without flow of information the WIL component will be less useful and of minimal value for the three parties. WIL can only be successful if the flow of information between the three parties is managed optimally.

5 CONCLUSION

WIL has become a critical tool to manage and process student exposure to applying theoretical knowledge in a practical way. Liaison and communication based on a workable solution have become critical and need strategic intervention. The study and analysis of the WIL processes in place at US HEIs have found the WIL process to be a highly advanced and developed process applied in a very strategic manner. The conceptual framework that has been developed from the HEIs in the US frameworks guides the approach to use as a centralised computer based IM for WIL solution. All activities and registrations are centrally hosted which allows all data related to WIL to be kept in one space. This permits all student registration, placement and progress to be recorded centrally. Dedicated and trained mentors populate a centrally controlled WIL system which monitors student progress and performance. The system is highly advanced and allows optimal use of the IM for WIL process which makes it an ideal system against which to benchmark and from which to plan and develop. The system furthermore offers employers the opportunity to liaise not only with the student, but also to remain in touch with the HEI in order to achieve the desired outcomes of the WIL process. The WIL process should therefore be based on good practice principles in order to manage the information between the triad relationships effectively.

The article provides the foundational work for the development of a conceptual framework to effectively manage the information for the WIL process. It is from this framework that a testing framework will be developed for an HEI in South Africa. This research will establish an effective feedback process of information that could potentially be exchanged between the three parties. This developed conceptual framework may be implemented at HEIs in South Africa after rigorous testing. With time this framework can be tested in a number of settings that may in turn lead to the development of a workable model for IM for WIL for the South African higher education landscape.

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