Summer 10-6-2011

The Road Less Travelled –Transforming Information Systems Research into Practice

Christine Van Toorn

Vincent Pang

Jonathan Paul

The Road Less Travelled –
Transforming Information Systems Research into Practice

Van Toorn, Christine, University of New South Wales, Sydney, NSW, Australia, c.vantoorn@unsw.edu.au

Pang, Vincent, University of New South Wales, Sydney, NSW, Australia, VincentPang@acslink.net.au

Paul, Jonathan, Achievement First, Brooklyn, NY, USA, jonathanpaul@achievementfirst.org

Abstract

The issue of 'transforming Research into Practice' is not new to the discipline of Information Systems and has generated much interest over the years. In this paper we propose to examine the transfer of research knowledge and research skills from Academic supervisors to undergraduate students. This study will focus on the transfer process occurring during the students' final year whilst undertaking the honours research component of their degree program. This research-in-progress paper proposes a conceptual research-to-practice diffusion framework in order to facilitate the study of the transfer of research knowledge and research skills via the application of social judgement theory as the underlying theory. A pluralist methodology with a sequential research design is proposed for this exploratory study.

Keywords

Research Knowledge, Research Skills, Research-to-Practice, Knowledge Transfer, Undergraduate Research Degree

1 Introduction

The issue of 'transforming Research into Practice' is not new to the discipline of Information Systems (IS). There has been heavy criticism that some of the research conducted in the field of IS is of little relevance to industry (Benbasat and Zmud 1999). Some purport that the transfer of knowledge plays an important role in ensuring that research findings are appropriated in practice Lyytinen (1999). According to Davenport and Markus (1999), the conduct of practical and relevant IS research is only the tip of the iceberg, they profess that "an equally important audience is today's student - tomorrow's practitioner". To this end, Rosemann and Vessey's paper (2008) analysed and suggested ways in which to improve the relevance of IS research to industry. More often than not, it is found that even when the research is deemed to be relevant to practice, the actual process of transforming the research into practice remains a challenge for most academics.

What needs to be acknowledged, is that this on-going issue of linking research to practice is not only limited to IS, but is also applicable to other disciplines within a business School. For instance, the research-practice gap in Human Resource Management (HRM) has also been addressed in a special issue of the *Academy of Management Journal* (2007, Vol. 50, No. 5), dedicated to the shortfall in the research-practice gap in the field of HRM. The editor of this special issue, Sarah L. Rynes (2007), categorises the research-based propositions into two segments: *research* and *education*. Of interest to the current study, is Rynes' summary of findings in the *research* segment, presented across three broad categories and summarised by the authors in Table 1 below (citing sample suggestions to help bridge the research-practice gap for each category).

Category in Research segment	Sample of Specific Examples
(1) Methods of increasing the relevance and usefulness of academic research for practitioners	• Conducting research with practitioners (Latham 2007) • Write articles for and publish research in practitioner

	journals (Latham 2007; Rynes et al. 2007)
(2) The need for more direct study of research translation and knowledge transfer processes	• Conduct research on the adoption and diffusion of human resource research findings to develop a theory of diffusion (Latham 2007) • Provide data-based evidence on the perceived causes and solutions of the "translation" problem (Cascio 2007)
(3) Suggestions for expanding or modifying publication outlets and formats	• Require a section on practitioner application in all scholarly articles in academic journals (Cohen 2007)

Table 1. Research Segment (Rynes 2007 pp 1046-1047)

In addressing the *education* segment of her research, Rynes identifies that we need to "ensure practitioners understand what research is and how to access it" (Rynes 2007, p. 1047). A specific example provided by Rynes is the need to "educate students regarding research processes, in addition to research findings and practical applications" (Rynes 2007, p. 1047, referencing Cohen 2007).

The authors acknowledge that whilst the research reported in the special issue focuses on human resource management, we strongly believe that the findings can also be applied to the discipline of IS. For example, the issue of whether knowledge in research can be transferred to course material via formal training (Cohen 2007) could also be applied to the IS discipline.

To this end we believe that research across a combination of the *education* segment and category (2) in **Error! Reference source not found.** is worth pursuing, i.e. we wish to study the transfer of knowledge from research-to-practice within the discipline of IS. This research-in-progress will concentrate on the transfer of knowledge from research-to-practice occurring in honours students studying IS. Honours students are undergraduate students who undertake research in their fourth and final year via the completion of a thesis component and associated high-level courses (hereafter, they will simply be addressed as student/s). These students are awarded a Bachelor Degree with Honours, after the successful completion of their honours thesis component and associated coursework.

Of particular interest to this study is the process of the transfer of research knowledge and research skills gained by students during their honours year. When these students graduate with honours and work in industry, of interest, is the direct transfer of research knowledge and research skills - gained from doing their research - to their work, i.e. do they apply their knowledge and skills learned from their research into their current work in industry? In this context, research knowledge (RK) is defined as the knowledge gained by students while they are conducting their research such as reading literature (e.g. academic journals and books) and writing their honours thesis. On the other hand, research skills (RSk) is defined as the skills gained by students through the process of conducting their research - for instance, defining a research problem; designing a research approach to address the research question(s); collecting data; and analysing data in order to come to a conclusion.

A better understanding of the direct transfer of knowledge from research-to-practice is of interest to both IS researchers as well as researchers across other business related disciplines. Moreover, institutional management such as the Head of School of IS, Dean of the Business School and Educational Directors all wish to know how their undergraduate research programs are performing. Whilst institutional management is interested in the value and usefulness of an UG research degree, the students in turn are interested in being able to *identify* and perhaps even *quantify* the value of undertaking an honours degree. The students in general would be more likely to complete the honours component if they were able to be assured that it would enhance their job prospects. In turn, the organisations' graduate recruitment team would also like to be able to somehow 'quantify' the knowledge and skills gained by these students and measure the 'value-added' component of the students' honours degree, and its impact or overall contribution to the organisation.

This research-in-progress paper will adopt a pluralist methodology with a sequential research design (Mingers 2001) in order to facilitate the study of the transfer of RK and RSk via the application of

social judgement theory. The paper is arranged in the following order. The authors will firstly present the background for the study, followed by a discussion on the relationship/s between RK and the transfer of that knowledge so that it can be put into practice (i.e. in industry). The research methodology will then be proposed, taking into consideration requirements for the development of a suitable survey instrument to enable the research questions to be addressed. The paper will conclude with a discussion of the potential limitations of the study.

2 Background

The primary focus of this research-in-progress paper is to provide insight into the process of transforming RK into practice. In this study, the authors have elected to focus on such processes that are already in place – namely, the direct transfer of honours students' RK and RSk into practice.

2.1 Honours Students

The School of Information Systems (IS) at the University has a number of undergraduate (UG) and postgraduate (PG) students undertaking a variety of degree programs. In general, UG degree programs are of three (3) years duration, with honours students undertaking an extra year of study in order to complete the requirements of the honours program.

The honours component includes a Thesis, comprising a written piece of research work as well as high-level course components. All of the honours components must be completed in two (2) university semesters. Students must achieve a weighted average mark (WAM) greater than or equal to 75%. Of the students who are considered to be eligible are invited to participate in the honours program.

Of particular interest to this school are the industry sponsors, who support the industry scholarships, value the conduct of collaborative research and are keen to collaborate with academia. The general view that is shared by many of these industry partners is that students who have undertaken an honours degree are better equipped to think independently and have gained more knowledge and skills which in turn will help them to perform at a higher level in the workplace than their counterparts.

The authors however acknowledge that this may well be a "self fulfilling prophecy", as only the most academically gifted students are invited to undertake honours. In turn it is expected that these students will more easily pick up new skills and gain knowledge, and the authors acknowledge that there may well be a bias to the proposed research. However, the issue remains that a wide gap exists with much work still needed to be done in order to determine how best to transform IS research into practice.

2.2 Research Knowledge (RK)

In general, when referring to the transfer of knowledge and skills, researchers have tended to focus on the transfer of training content in terms of acquired knowledge and skills (Tesluk et al. 1993). However, there appears to be a general lack of focus on the transfer of knowledge and skills in relation to the applicability of academic research-to-practice.

The authors define RK as knowledge gained by the students whilst undertaking the thesis component of their honours degree (i.e. conducting their research). Students are expected to read a wide range of literature (e.g. academic journals and books) and be able to identify a "gap" or a "need" in the literature. They will then need to determine a plan of action, decide the best method to collect and analyse their data, and present and collate all of their findings – including limitations of their study – in a formal honours thesis document. Students will generally gain their RK through their reading of related literature and by conducting their own research – under the guidance of their supervisor (who in turn can also expect to benefit by further gaining new knowledge via students' findings). The students' RK is expected to transfer back into the research domain via the publication of their findings in papers submitted to conferences and journals.

We propose that RK in the field of IS is transferred to practice via these students, and that in turn, the RK gained from these students will be put into practice via their work. For instance, a student who has conducted a research project in the area of IS security can be expected to possess a heightened

understanding of security related issues which can - and generally will - be put directly into practice when they commence working in a security related area. On the other hand, we also acknowledge that some of the research may not be directly transferred because of the students' chosen career path – which may not be directly related to their research area.

In this study, the authors aim to understand *how* RK is being transferred, i.e. how the students use their RK in their line of work, as well as *why* RK may or may not be transferred. Some of the reasons we have been able to identify is that the RK may not be considered relevant to the students' current working position, or, that the RK may not be deemed to be relevant to practice in general. Alternatively, we argue that whilst conducting their honours research, students might gain knowledge about *how* an organisation operates which in turn assists them in pursuing their career.

Another point to consider is that there may be difficulty in distinguishing between the knowledge gained by these students through their coursework and that gained via the research component. For instance, let us assume that a student attends two courses, namely *Security in IS* and *E-Commerce*, and then undertakes an honours research project to examine security in e-government. It may then be difficult to distinguish whether the student's RK has been transferred from the coursework component/s or from the honours research component. This issue will be addressed later in this paper.

2.3 Research Skills

In the past, researchers (such as Cheng, 2000) have tended to concentrate on either managerial or technical skills. However, in this study we have elected to focus on a different set of skills, which we will call research skills (RSk), defined as the skills gained by the students through the process of conducting their honours research component.

The school offers two specific 'research-based courses' which are core components of the honours research study program. Students must attend and satisfactorily complete both of these research courses in order to be able to continue with their honours research year. These two courses are specifically designed to teach the students how to; address a research problem; find/identify a gap in the current body of literature; identify research question(s); design a research approach; identify suitable research methodologies and their applicability in terms of data collection (e.g. case study, experimental, survey etc.); analyse data; and finally to write the thesis document. Students are expected to conduct their research by applying what they have learned from these research courses. Thus, for the purpose of this study, research skills (RSk) are defined as the skills gained by the students through the process of conducting their honours research component.

We propose that the research skills gained by the students undertaking the thesis component are of great value and importance in their practical work environment i.e. in practice. For the purpose of this study, RSk gained by the students include problem solving skills as well as analytical skills and we further expect that some of these RSk will also be transferred into practice once the students are actively engaged in the workforce. To put it another way, a research problem can be translated as a business problem; a research gap can be translated as a business process issue; and the design of a research approach can be translated as the design of an approach to resolve an existing business problem. Other skills gained whilst undertaking an honours research project may include activities such as how to identify a research problem, how to isolate critical factors, how to manage their time whilst conducting research. In terms of practice, these skills can be translated as, *how* to approach a business project, *how* to identify critical issues and *how* to manage a project in a work environment.

This research-in-progress will seek to identify and thus help the authors understand *how* the students translate their RSk to their working environment. Cohen (2007) argues that students need to be educated in matters such as research processes and their application to a practical environment. We acknowledge that students who have completed an honours thesis component have been taught how to conduct research and how to read literature, however, what is of interest to the current study, is whether these same students are continuing to actively read academic and/or practitioner publications once they are actively engaged in the workforce.

2.4 Research Questions

In order to identify the RK and RSk gained by students who have successfully undertaken and completed an honours thesis component, the authors propose the following research questions:

R1: Is the research knowledge of the honours students being transferred into practice?

R2:How is the research knowledge of the honours students being transferred into practice?

R3: Are the research skills of the honours students being transferred into practice?

R4: How are the research skills of the honours students being transferred into practice?

3 Conceptual Research-to-Practice Framework

The development of the conceptual research-to-practice framework was inspired by the work undertaken by Rynes (2007) and her research colleagues. Specifically, Rynes' argument that we, as academics, should "seek to understand the academic-practice gap through research" (p. 1046), and the "need for more direct study of research translation and knowledge transfer processes" (p. 1047) (see examples in **Error! Reference source not found.**).

As there is no causal relationship being tested in the current study, the authors have specifically elected to present a framework rather than a model, with no intention to generalise the framework. The aim is to understand the transfer of RK and RSk into practice. As previously noted, social judgement theory is applied to explore the understanding of this transfer process.

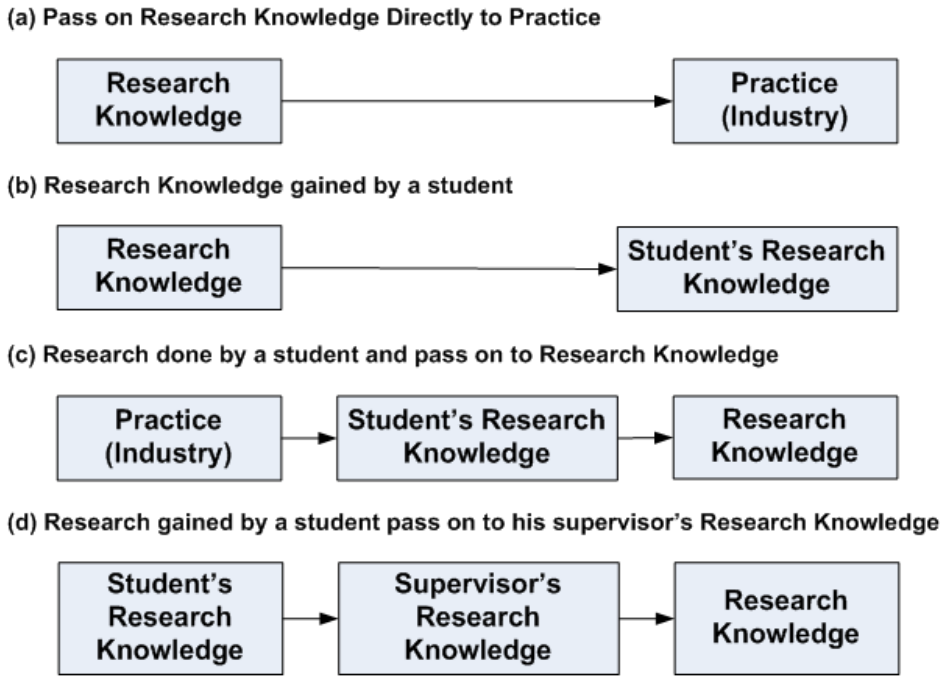

Figure 1 Transfer of Research Knowledge

The transfer of research knowledge as shown in ***Figure 1*** can be explained as follows:

(a) Direct transfer of RK is when the RK is directly transferred or diffused to practice in industry. This is achieved via academic-practitioner publications (e.g. MISQ Executive) or by exposing findings directly to the practitioner/s (e.g. attending a seminar or conference or enrolling in a course where research materials are presented).

(b) A student develops their research proposal and gains RK by reading relevant literature (e.g. conference and journal papers). For instance, a student conducting a research project in the area of IS security in e-government, would be expected to read literature related to security and e-commence/e-government as well as relevant theories and research methodologies.

(c) Students are expected to conduct their data collection and data analysis. Research findings will be the students' contribution to the RK through the publication of their Thesis, and/or subsequent preparation of conference and/or journal papers.

(d) In the process of writing their honours thesis and related publications, it is expected that their supervisors will assist them with the process, generally via face-to-face discussion and feedback. We propose that in turn, the supervisors also learn from the students' findings. The research findings are expected to be channelled back into the research domain via publications.

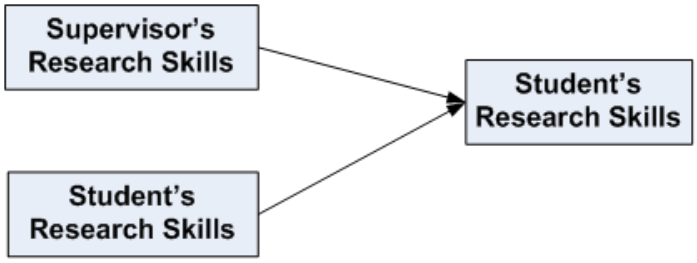

Figure 2 Research Skills gained by a student

The student would be expected to develop an instrument to collect data such as a survey, or prepare a list of semi-structured interview questions. Thus, the student would have developed their RSk through the process of preparation (see Figure 2).

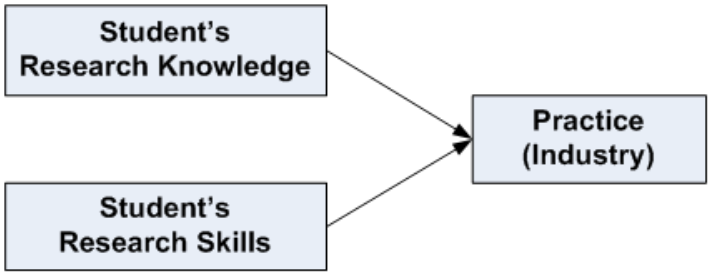

Figure 3 A student put his Research Knowledge and Research Skills into Practice

It is expected that when these honours students graduate and commence working in industry, they will use their RK and RSk they have gained and in turn make a valuable contribution to industry (see Figure 3). Thus, the students transfer their RK and RSk from research-to-practice.

3.1 Knowledge Transfer

When scholars examine the transfer of knowledge, they tend to focus on the motivation and goal setting of the participants as part of the knowledge transfer process. In keeping with Kolb's learning cycle (Kolb, 1984), scholars may intend to apply such knowledge and skills in their work for the purpose of experiencing the newly acquired ideas or concepts in their workplace settings (Keys and Wolfe, 1988). When addressing such transfer, learning tends to be one of the measures used. Kolb believes "learning is the process whereby knowledge is created through the transformation of experience" (1984, p. 38). Chen and Shaw (2006, p. 91) go on to describe knowledge transfer as: "...the application of acquired skills and knowledge into different situations. Unless the transferring process occurs, learning has little value."

The argument here is that the driver behind knowledge transfer is a participant who wants to learn and who must possess both motivation and goal setting (Chen and Shaw 2006). In addition, Chen and Shaw argue that "there is a need to assist learners in transferring their acquired knowledge into future applications" (p. 89). On the other hand, training literature (Cheng 2000) focuses on *how* the lecturer delivers materials to the students, and *how* the knowledge is being transferred to the students.

For the purpose of this research-in-progress, the goal of the student is to graduate, and their motivation is to undertake an honours research project in order to obtain a Bachelor Degree with Honours. However, we know from experience that often the selection of a suitable supervisor is of more importance to the student than the selection of the research topic. Students tend to undertake a research project based on a topic of interest as suggested by their chosen supervisor, students who know exactly the type of research project they wish to undertake, are in the minority. This study will focus on the transfer and diffusion of RK and RSk from the perspective of the student. We argue that it is the students' motivation and goal to complete their degree program that drives the transfer of knowledge because essentially, knowledge is gained by the students actively undertaking their research project and not by being passive - or taught directly - as in a typical classroom environment. Having discussed the transfer of knowledge, we look to apply social judgement theory in order to help explore and explain the diffusion of RK and RSk.

3.2 Social Judgement Theory

Social judgement theory has evolved from social psychology and focuses on an individual's judgement (Shefir et al. 1965), specifically, where an individual has to use their judgement in order to compare between two or more matters or situations. Shefir et al. (1965) applied this theory to examine attitude change in their social judgement-involvement approach. For this study we have elected to apply social judgement theory because the student has to evaluate whether the RK and RSk gained from their research project has been – or will be – able to be transferred into practice. We do not seek to examine the attitude change of an individual (student) but do rely on the student's judgement in relation to the transfer of knowledge.

We recognise that it may be difficult to distinguish between the level of knowledge gained by students undertaking a coursework component and the level of knowledge gained from undertaking research within that specific area. However, it can also be argued that course notes may also incorporate a body of literature. We acknowledge this issue and consider it to be a limitation of this research-in-progress.

4 Research Methodology

An exploratory approach has been adopted in this study as it allows flexibility and adaptability to change (Yin 2003). A pluralist methodology, described as a study using a combination of research methods, namely case study and survey, is applied; having different information sources helps to improve and to generate a richer understanding of the knowledge transfer process (Mingers 2001; Yin 2003). Sequential research design, described by Mingers (2001) as, "methods employed in sequence with the result of one feeding into the latter one", is selected as a pluralist methodology as there are two parts to this study, with the second part being critically dependant on the results of the former.

The first stage of the study will use a case study approach in order to explore issues surrounding the transfer of RK and RSk, this will be achieved by conducting interviews with a number of honours graduates (Alumni). Graduates to be interviewed for this study will be specifically selected. Our aim is to select graduates who are currently working within their research area as well as graduates who are currently employed in areas that are significantly different from their research area.

The second stage of this study will use interview data obtained from stage one, to develop a survey instrument, Dillman (2000) will then be applied to improve the survey quality. We expect the survey instrument to contain both Likert-scale questions as well as open-ended questions. Our aim is to survey honours graduates who completed their Bachelor research degree program in the last ten years.

5 Conclusions and Limitations

Whilst acknowledging that the proposed research is neither new nor innovative, the authors believe that there exists a gap in the general research area of transforming IS research-to-practice which this study seeks to address. It can be argued that the skills of solving a problem and conducting a piece of research can be classified as a 'skill' within itself, and may be something that the students gain automatically whilst undertaking a research project. However, what is significant about this research-in-progress is that the focus will be to further understand *if* and *how* RK and RSk are transferred from research-to-practice when students undertake a research component within their Bachelors degree. Social judgement theory will be applied to help explain and understand the students' judgement in the transfer of RK and RSk. Moreover, a conceptual research-to-practice framework is presented to express how the RK and RSk may be transferred.

The authors acknowledge the following limitations of the proposed study, only undergraduate students undertaking an honours thesis component will be surveyed. This means that all other students undertaking research degrees, such as Masters and PhD students will be excluded. In addition, the focus of the study will be on the transfer of knowledge for an individual student and thus will not address synergies which may be gained from group learning.

In conclusion, an area of future interest may include the study of how practical knowledge obtained by students in industry could be channelled back to the academic environment, thus bringing the learning process full-circle.

REFERENCES

Benbasat, I. and Zmud, R.W. (1999). Empirical Research in Information Systems: The Practice of Relevance. MIS Quarterly, 23(1), 3-16.

Cascio, W.F. (2007). Evidence-Based Management and the Marketplace for Ideas. Academy of Management Journal, 50 (5), 1009-1012.

Chen, C.C. and Shaw, R.S. (2006). Online Synchronous vs. Asynchronous Software Training Through the Behavioral Modeling Approach: A Longitudinal Field Experiment. International Journal of Distance Education Technologies, 4 (4), 88-102.

Cheng, E.W.L. (2000). Test of the MBA knowledge and skills transfer. International Journal of Human Resource Management, 11 (4), 837-852.

Cohen, D.J. (2007). The Very Separate Worlds of Academic and Practitioner Publications in Human Resource Management: Reasons for the Divide and Concrete Solutions for Bridging the Gap, Academy of Management Journal, 50 (5), 1013-1019.

Davenport, T. H. and Markus, L. M. (1999) Rigor and Relevance Revisited: Response to Benbasat and Zmud, MIS Quarterly, 23 (1), 19-23.

Dillman, D.A. (2000) Mail and Internet surveys: The Tailored design method, (2nd ed.) John Wiley, New York; Chichester.

Kolb, D. A. (1984) Experiential Learning: Experience as the Source of Learning and Development Prentice-Hall, Inc., Englewood Cliffs, N.J.

Keys, B. and Wolfe, J. (1988) Management Education and Development: Current Issues and Emerging Trends, Journal of Management, 14 (2), 205–29.

Latham, G.P. (2007) A Speculative Perspective on the Transfer of Behavioral Science Findings to the Workplace: The Times They Are A-Changin. Academy of Management Journal 50(5), 1027-1032.

Lyytinen, K. (1999) Empirical Research in IS: On the Relevance of Practice in Thinking of IS Research, MIS Quarterly, 23(1), 25-28.

Mingers, J. (2001) Combining IS research methods: Towards a pluralist methodology. Information Systems Research, 12 (3), 240-259.

Rosemann, M. and Vessey, I. (2008). Toward Improving the Relevance of Information Systems Research to Practice: The Role of Applicability Checks. MIS Quarterly 32 (1), 1-22.

Rousseau, D.M. (2007). A Sticky, Leveraging, and Scalable Strategy for High-Quality Connections between Organizational Practice and Science. Academy of Management Journal, 50 (5), 1037-1042.

Rynes, S. (2007). Let's Create a Tipping Point: What Academics and Practitioners Can Do, Alone and Together? Academy of Management Journal, 50 (5), 1046-1054.

Rynes, S.L. Giluk, T.L. and Brown, K.G. (2007). The Very Separate Worlds of Academic and Practitioner Periodicals in Human Resource Management: Implications for Evidence-Based Management. Academy of Management Journal, 50 (5), 987-1008.

Sherif, C. W., Sherif, M. S. and Nebergall, R. E. 1965. Attitude and attitude change. Philadelphia: W.B. Saunders Company.

Tesluk, P.E., Farr, J.L., Mathieu, J.E. and Vance, R.J. (1993). Generalization of Employee Involvement Training to the Job Setting: Individual and Situational Effects. Personnel Psychology (48), pp. 607-632.

Yin, R.K. (2003). Case study research: design and methods, (3rd ed.) Sage Publications, Thousand Oaks, California.