The Dynamics of Communication in Electrical Generation Engineering

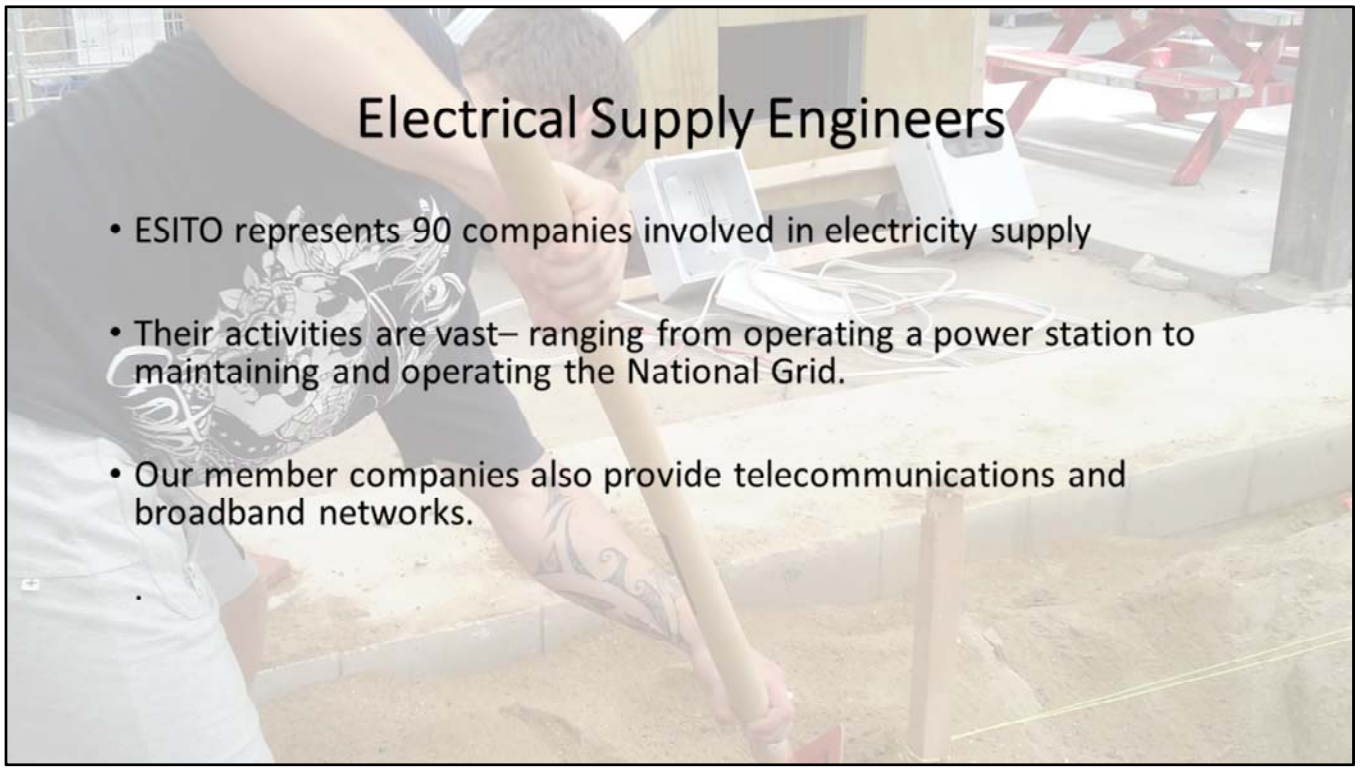
"Explicit knowledge is like an Island surrounded and supported by the tacit knowledge sea" (Stacey 2001)

Knowledge Management

- A organisation focused on people, processes and procedures.
- Focused on improving business performance.
- A long-term, continuing initiative.

Knowledge management is not:

- A system focused on technology.
- A single technology or technique that can solve your KM issues.
- An event. (Boomer,2004)



It's ESITO's job to develop qualifications that enable the industry to educate and train its workforce to nationally accepted standards.

Understanding the make-up of our industry, and shifts in its skill requirements now and in the future, is an important part of our work

This research project investigates on-the-job-training (OJT) for ESITO. OJT involves gaining experience or skills and the project examines improvement in employees' productivity through training and collaboration. It investigates theories of tacit and explicit knowledge transfer, learning organisations and communities of practice. OJT is defined as including formal and informal training programs. The main focus, however, is learning from collaborative experience in the workplace. The workplace has become a rich context for learning and a major focal point for human resource development (Bierema and Eraut 2004***).***

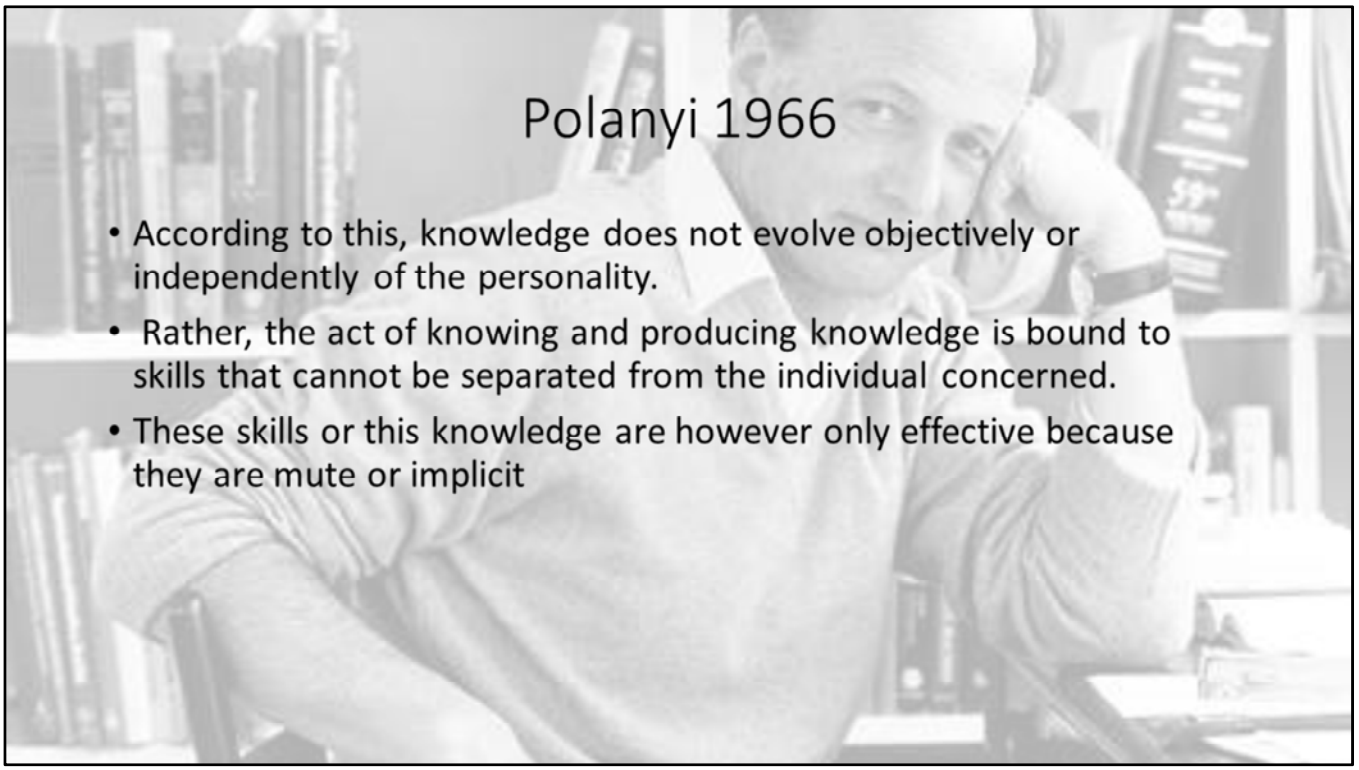
Connexis was established in October 2013 merging ESITO (The Electricity Supply Industry Training Organisation) and Infratrain (a civil construction industry training organisation).
Connexis is now the Industry Training Organisation mainly due to a skill gap created in the 1970's and 19890's
They have nationally-recognised qualifications. These are mainly achieved through on

the job training and provide structured career pathways for people in their industry. They work in industry sectors including civil construction, electricity supply and telecommunications.

Tacit versus Explicit Knowledge

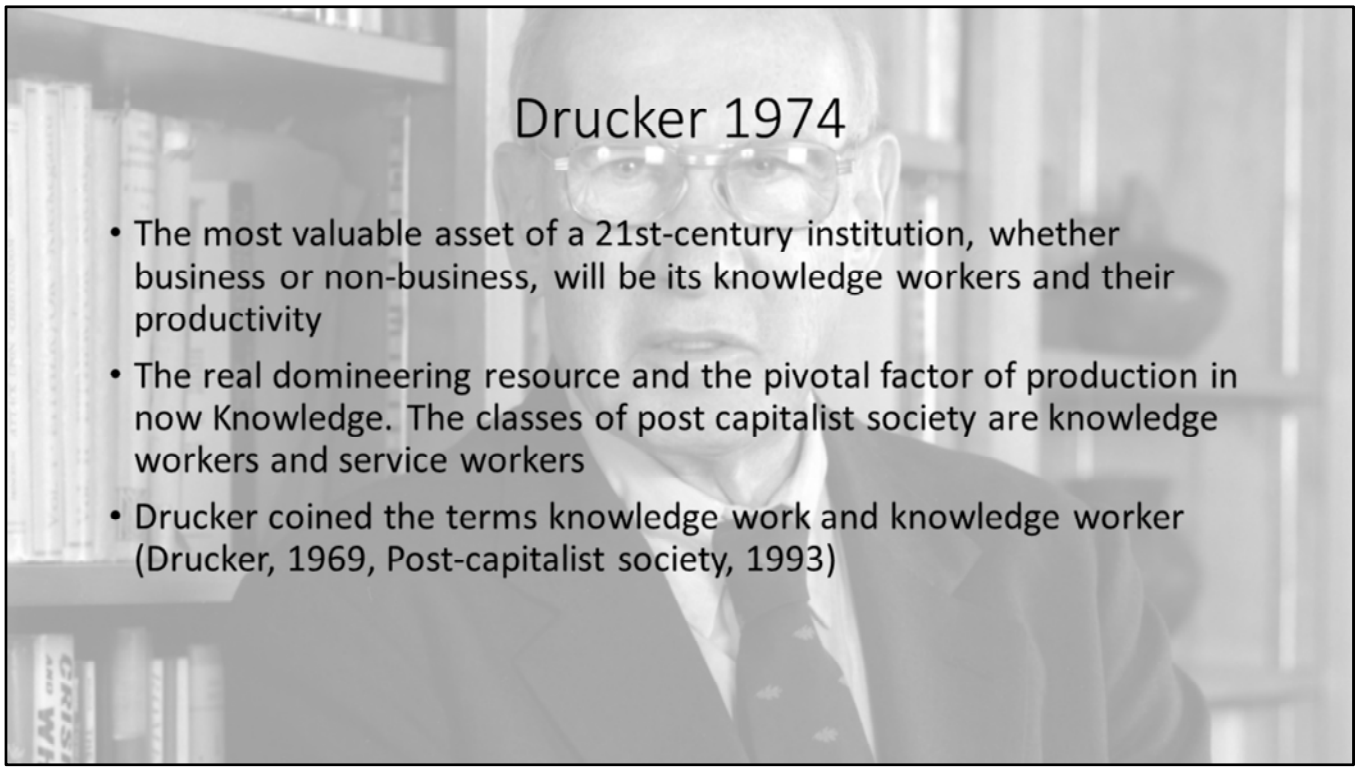
- Tacit knowledge is knowledge that people carry in their minds and is difficult to access
- Developed and internalized over a period of time.
- Personal learning -accumulated and embedded
- shared and re-used through casual conversation

- Explicit knowledge: is formal, documented and can be easily shared, organized and stored
- Explicit knowledge typically, comes books documents and can be shared
- Disseminated quickly through information systems



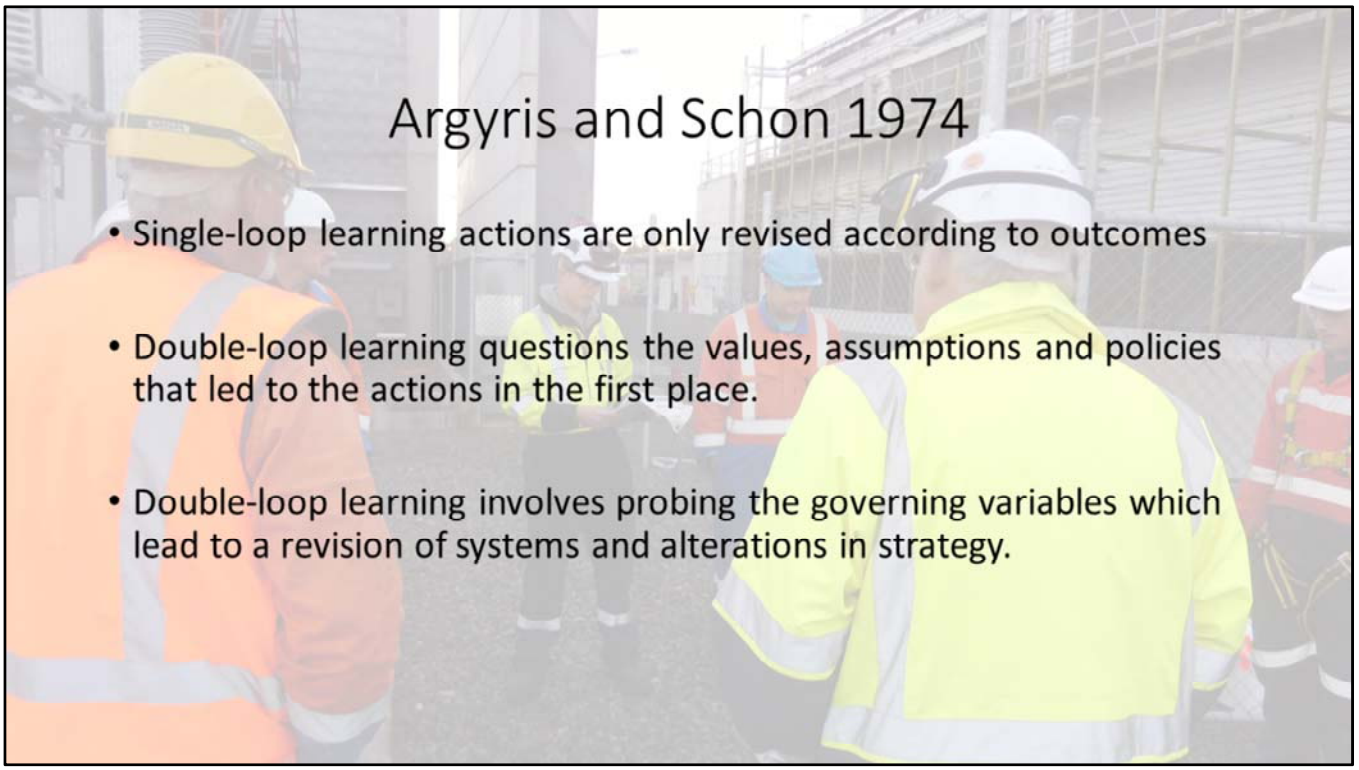
Polanyi 1966

- According to this, knowledge does not evolve objectively or independently of the personality.
- Rather, the act of knowing and producing knowledge is bound to skills that cannot be separated from the individual concerned.
- These skills or this knowledge are however only effective because they are mute or implicit



What Drucker called the new technologies were not science but based on knowledge intertwined with technology. It is important to note he points out that technology itself is not new but the new technologies will need knowledge integral, not experience. They will embody a new economic reality – knowledge will be a central resource. They will employ knowledge workers – computer programming is based on knowledge . in every case he predicted the foundation for any job will be knowledge. the productivity of any worker will be to put to work concepts ideas and theories

Work and worker in a rapid period of change- dominate this century and next century. Most radical change to date- larger proportion of the work force in developed countries are not working with their hands but with ideas concepts theories (161)
The outputs of these workers are not tangible but intangible – knowledge and information.



Single-loop learning seems to be present when goals, values, frameworks and, to a significant extent, strategies are taken for granted. The emphasis is on 'techniques and making techniques more efficient' (Usher and Bryant: 1989: 87) Any reflection is directed toward making the strategy more effective. Double-loop learning, in contrast, 'involves questioning the role of the framing and learning systems which underlie actual goals and strategies (*op. cit.)*. In many respects the distinction at work here is the one used by Aristotle, when exploring technical and practical thought. The former involves following routines and some sort of pre-set plan – and is both less risky for the individual and the organization, and affords greater control. The latter is more creative and reflexive, and involves consideration notions of the good. Reflection here is more fundamental: the basic assumptions behind ideas or policies are confronted… hypotheses are publicly tested… processes are disconfirmable not self-seeking (Argryis 1982: 103-4).

Lave and Wenger 1991

Communities of Practice

The *learning organisation and communities of practice* will expand an organisation's capacity to create through explicit and tacit knowledge.

Situated activity (Lave & Wenger1991) learners participate in communities

Mastery of skill requires full participation practices of a community

- ***legitimate peripheral participation***.

Senge 1995

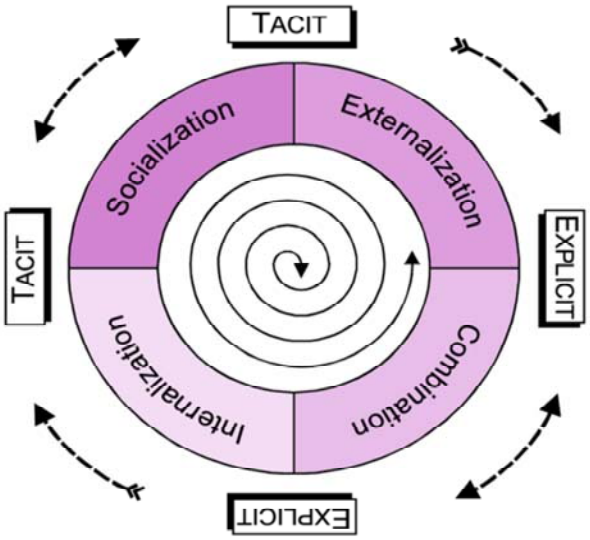
Fifth Discipline

- *Systems thinking*- a conceptual framework or a body of knowledge and tools that have been developed over time as patterns appear;
- *Personal Mastery* - those with high level of mastery recognize the results that matter. Continually clarifying and deepening personal visions is the cornerstone of a learning organisation, accessing untapped resources by focusing energy and developing patience;
- *Mental models* - by changing internal perceptions through conversations of inquiry and balance as insights influence others;
- *Building a shared vision* - a genuine vision which encourages all to learn and excel, generating a picture of the future;

By sharing in the enriching routines of a community, the meaning 'understanding and learning' then becomes relative to the contexts that routinely take place (Handley, Clark, Fincham & Sturdy 2007, Lave & Wenger, 1991).

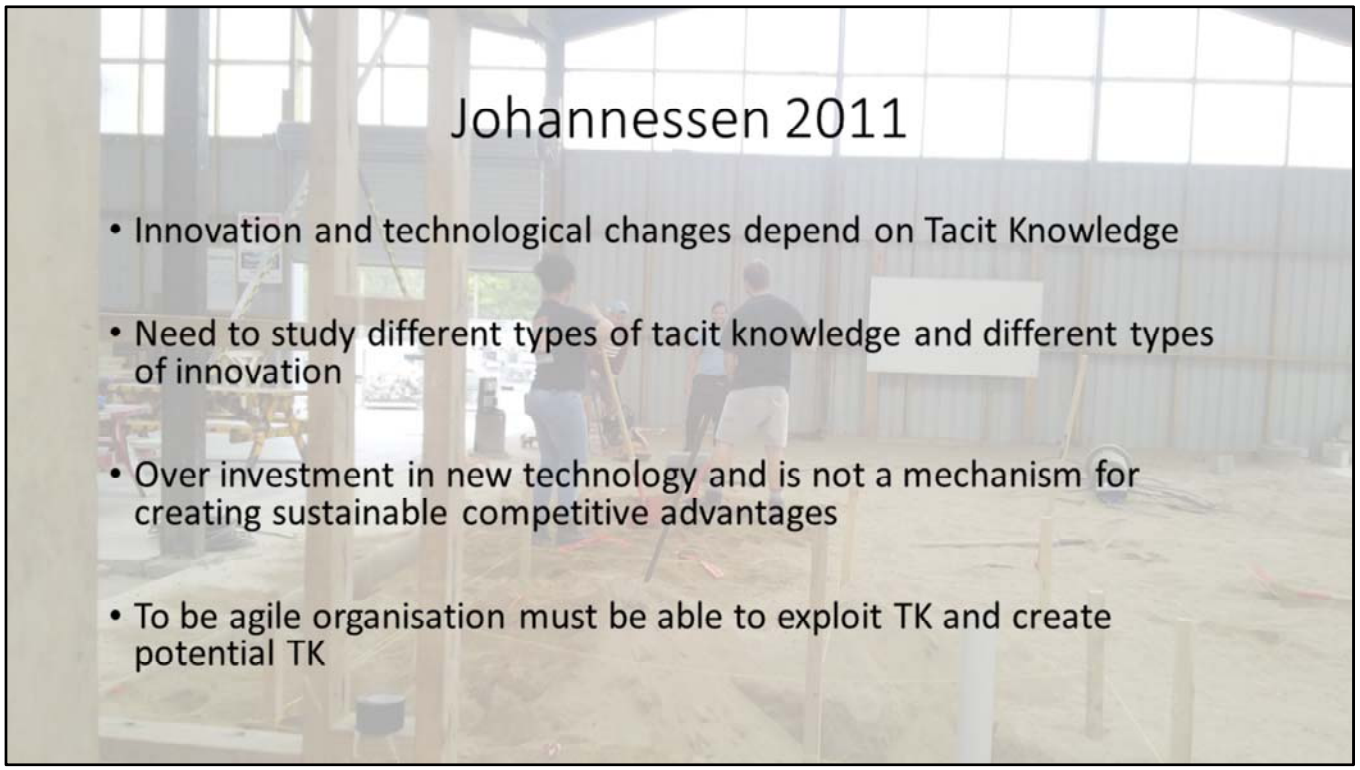
Nonaka & Takeuchi (1995)

- Nonaka & Takeuchi (1995) propose a spiral theory of work-based knowledge that requires organisations to enhance their competitive edge
- Ensuring that people share tacit and explicit knowledge. The sharing of knowledge facilitates the creation of new knowledge which, in turn, leads to innovation
- Employees interact in a knowledge spiral where individual knowledge is converted to organisational knowledge



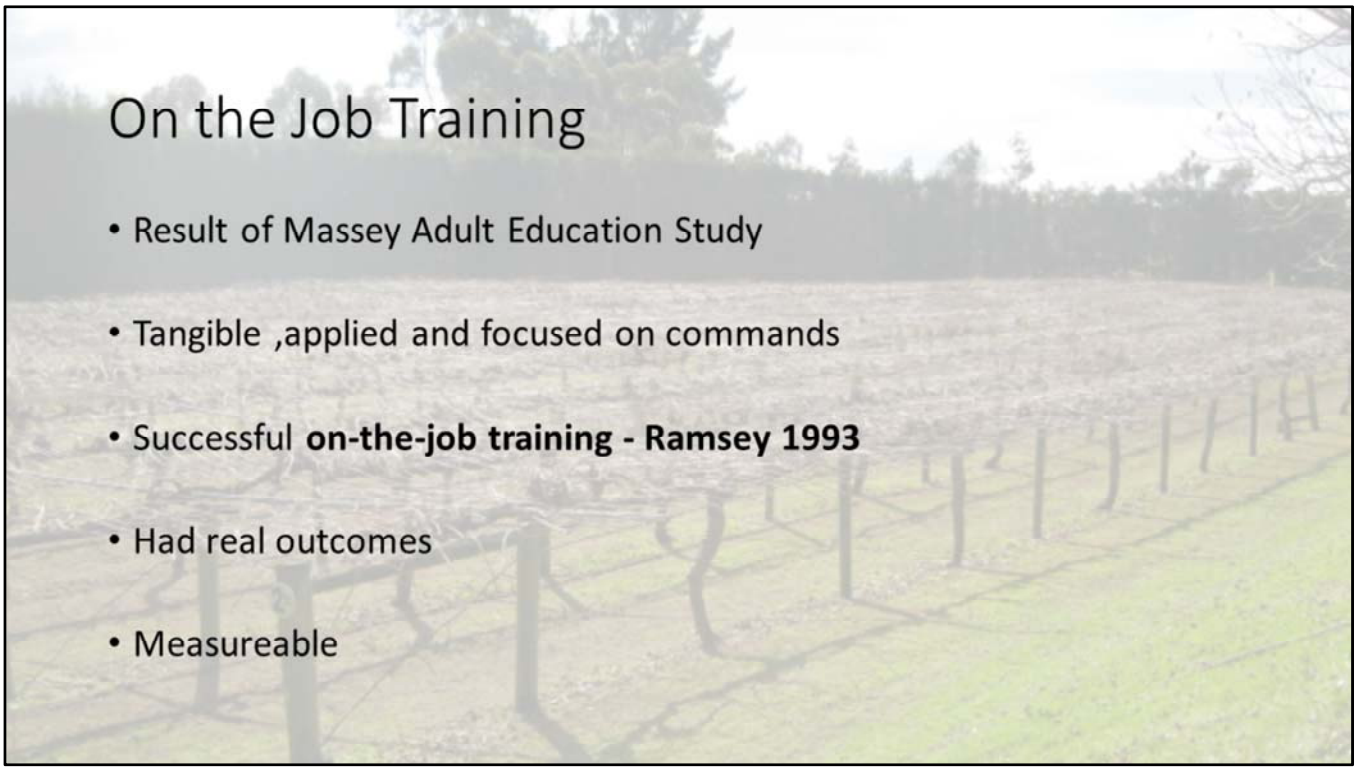
Source: Theorized by Nonaka and Takeuchi (1995)

The increasingly competitive nature of the global economy along with global demographic, occupational and workplace changes has significantly impacted on the nature of the workplace. This means that skill levels of employees need to be continuously cultivated and developed (Rowden, 2007). This can provide organisations with practical methods for dealing with the challenges they face in a global marketplace where technology is driving change at an unprecedented rate. Organisations are communities, being living human systems with a particular identity. More learning occurs in the workplace than in formal training (Rowden 2007).



Johannessen (Johannessen & Olsen, 2011)Janhonena & Johanson (Janhonena & Johanson, 2011) states that innovation and technological changes, depend on access to tacit knowledge. There is a need to study different types of tacit knowledge and the different types of innovation; this can be accomplished by establishing teams with different types of tacit knowledge for different forms of innovation. The conversion and fusion of tacit knowledge is crafted through action, reflection and emotional involvement (Johannessen 20 (Johannessen, Olaisent, & Olsen, 2001)tacit knowledge processes are based on a series of interlocked parts which cannot be tested in any other manner.

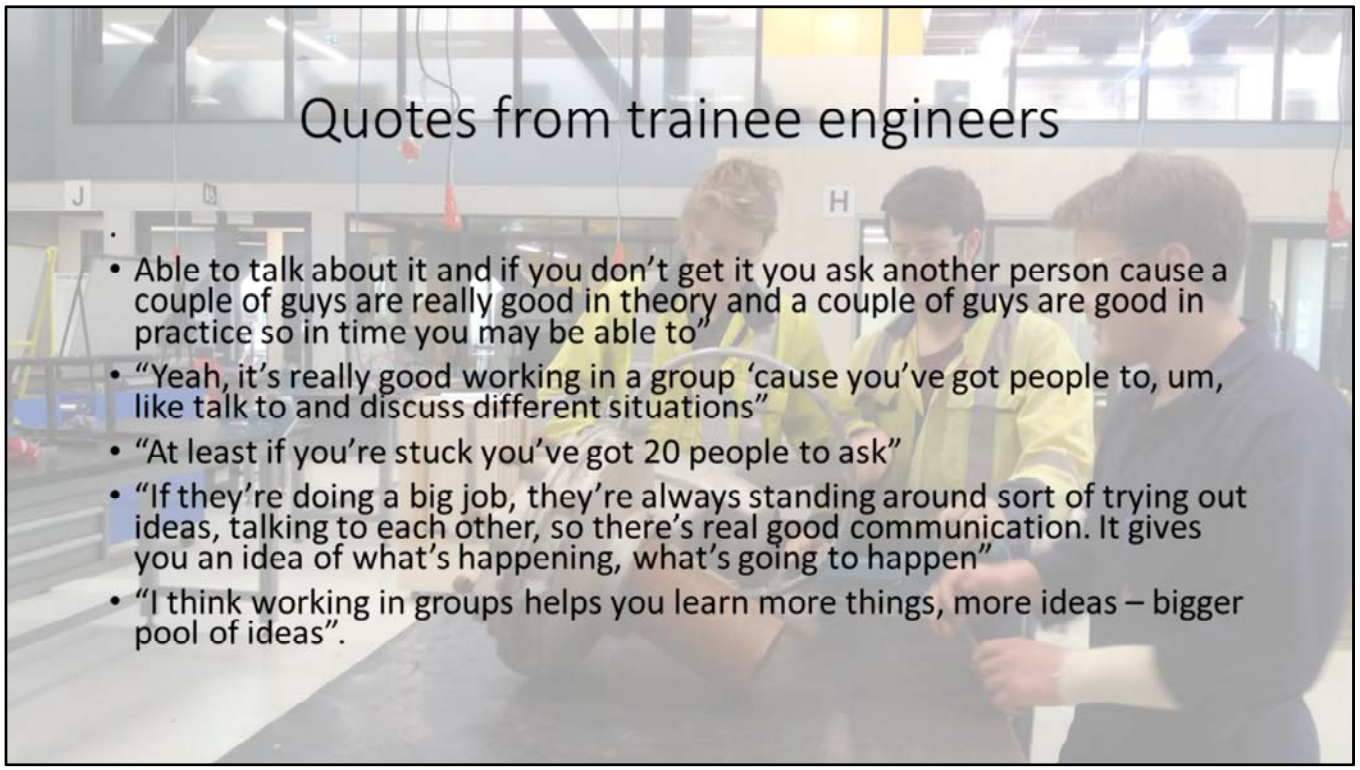
There has been an over investment in new technology that only supports the transfer of explicit knowledge, the investment in IT (information technology) influence tacit knowledge and “does not function adequately as a mechanism for creating sustainable competitive advantages”. Tacit knowledge has a crucial role in the process and exchange of knowledge for continuous improvement (Johannessen, Olaisent, & Olsen, 2001) the tacit knowledge triggers radical innovation and it is only those with excellent levels of experience that are able to initiate radical innovation. It is not possible to be able to predict but what is important is that organisation must be able to adapt and exploit tacit knowledge so that they are agile and position the organisation where it can exploit opportunities to capture potential tacit knowledge.


On the Job Training
• Result of Massey Adult Education Study
• Tangible ,applied and focused on commands
• Successful **on-the-job training - Ramsey 1993**
• Had real outcomes
• Measureable

Background

- ESITO Certificate Course set up in 2002
- Apprenticeship with Wintec – 8 years
- Masters Thesis – perfect subject base for HRM major
- Industry Partnership – Murray Samson and Graeme Teesdale
- Willing Recipients – welcome further studies


On the Job Training for ESITO Trainees
• Twenty three participants
• 15 first year apprentices and 8 Adult distance ESITO trainees
• Interviewed after their first OJT experience / current workplaces
• Interviews last 30 minutes to an hour



They continually explore ideas communally, transferring knowledge to ensure that they are learning organisations. When new viewpoints emerge and there are common bodies of knowledge, practices and approaches, these develop establishing relationships, interactions and a sense of identity which happens through narrative and dialogue (Clarke, 2010)

ESAP Trainees

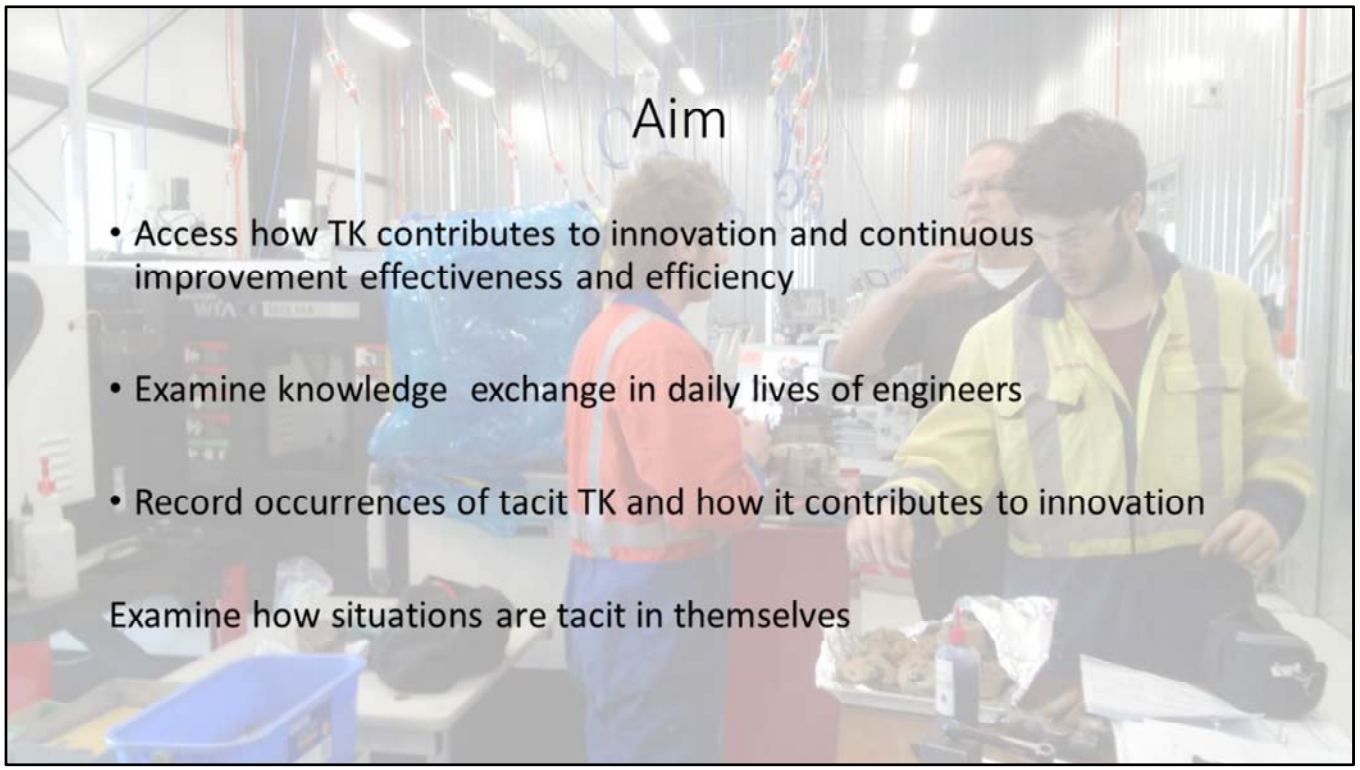
Value the opportunities to take part in workplace training because the training uses tacit and explicit learning in communities.

Facilitated through talking, questioning, observing and practicing.

Explore ideas communally, transferring knowledge to ensure that they are learning organisations.

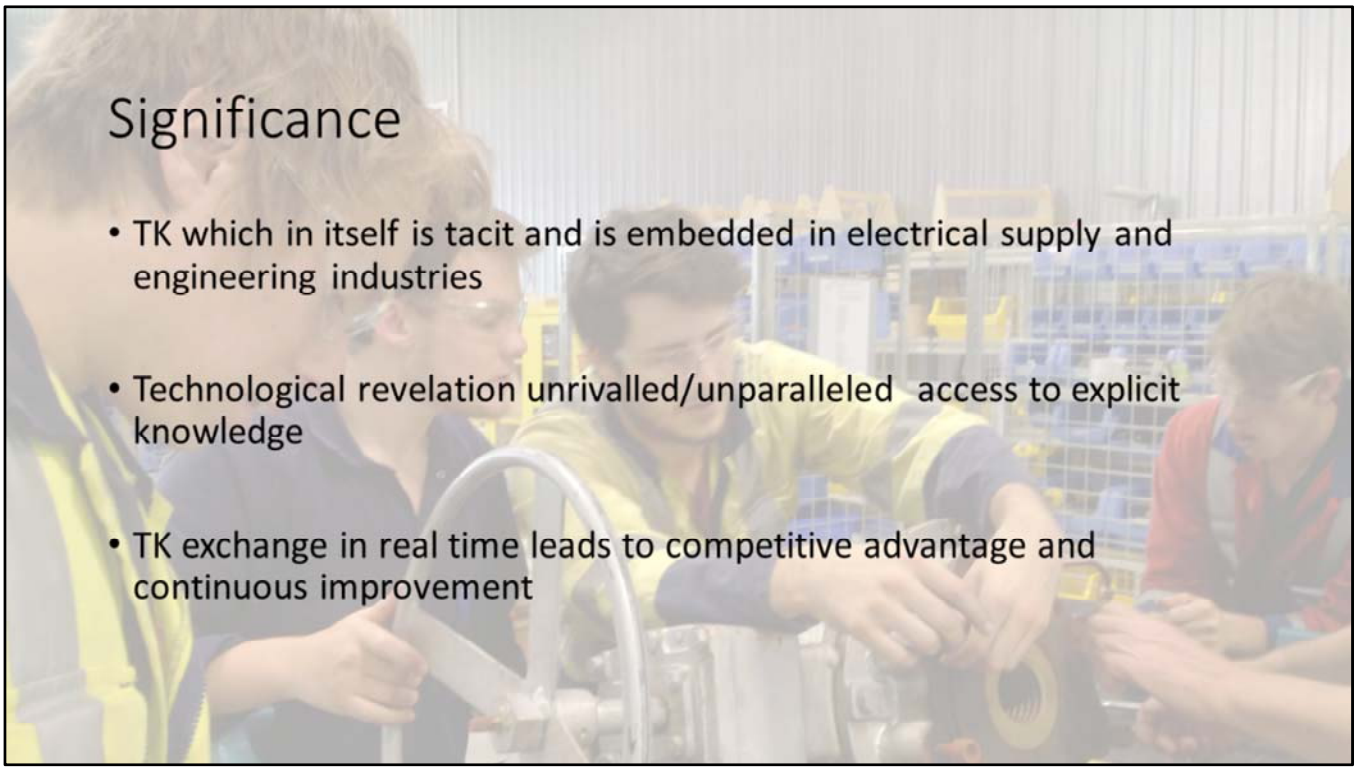
When new viewpoints emerge and there are common bodies of knowledge, practices and approaches, these develop establishing relationships, interactions and a sense of identity which happens through narrative and dialogue(Clarke, 2010)

This study aims to examine how electrical engineers share tacit knowledge on location/worksites through; experience, observation, imitation and practice. This transfer of information, intelligence, evidence and knowledge is meaningless without shared experience and socialisation. The sharing of tacit knowledge enables engineers to acquire and interpret new information and then to construct valuable solutions to solve problems/innovation.



.

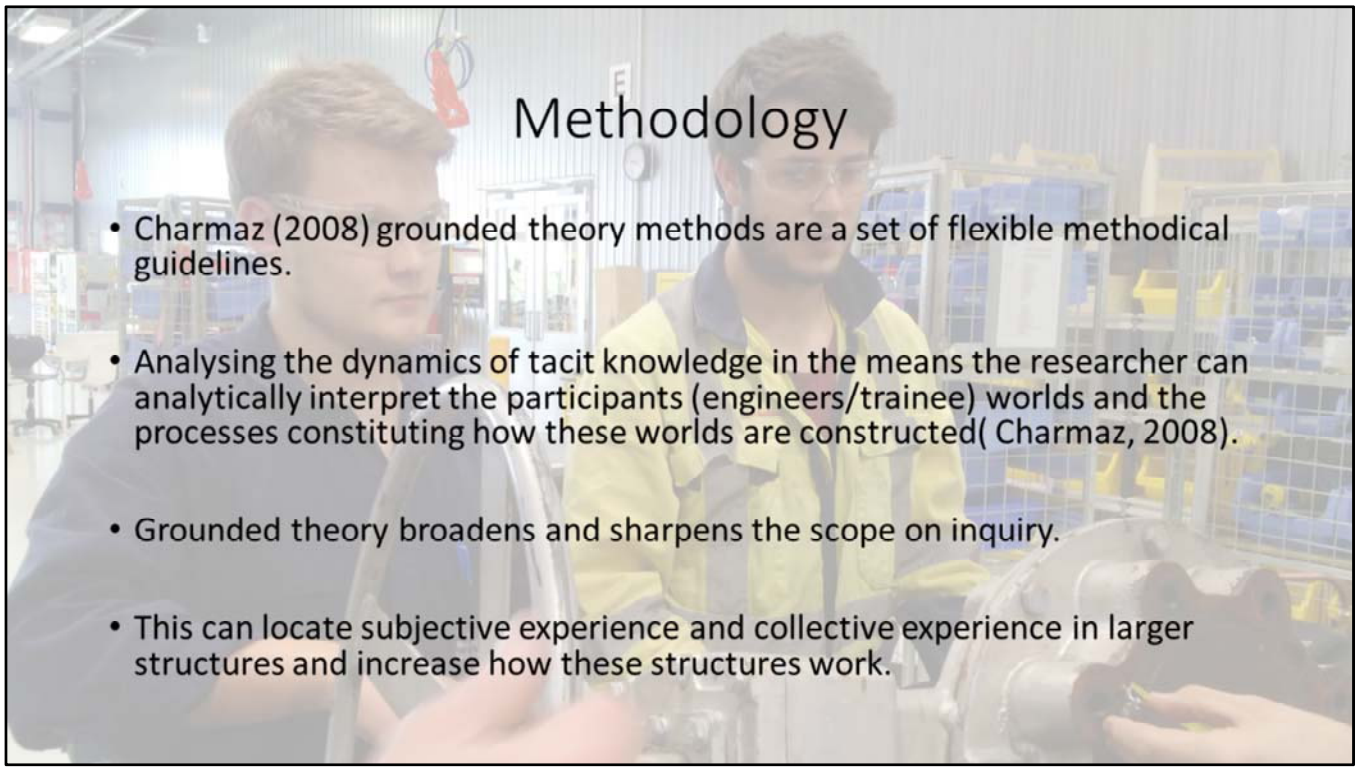
The aim of this research project is to access how tacit knowledge contributes to innovation continuous improvement, effectiveness and efficiency. By examining knowledge exchange that occurs daily in the electrical engineering workplace. By recording occurrences of tacit knowledge the researcher can verify how tacit knowledge contributes to innovation and. These situations are tacit in themselves as they take place every day without the realisation that they are happening however they are fundamental building blocks for continuous improvement



tacit knowledge which in itself is tacit and how it contributes to innovation in the electrical supply and engineering industries.

The technological revolution has given access to explicit knowledge and information, previously unparalleled by any other communication channel.

Yet the sharing of tacit knowledge in real time in the workplace still has an important part in innovation which in turns leads to competitive advantage and continuous improvement.

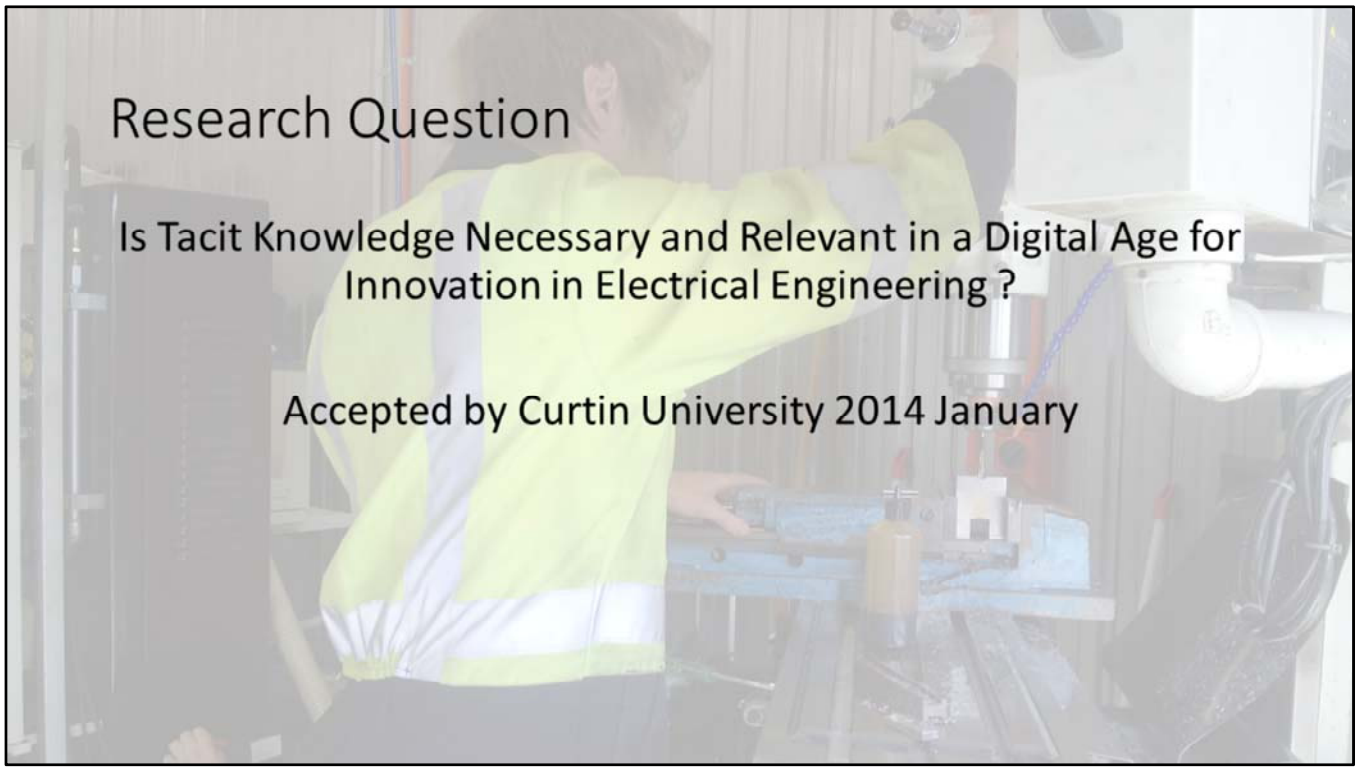


Methodology

- Charmaz (2008) grounded theory methods are a set of flexible methodical guidelines.
- Analysing the dynamics of tacit knowledge in the means the researcher can analytically interpret the participants (engineers/trainee) worlds and the processes constituting how these worlds are constructed(Charmaz, 2008).
- Grounded theory broadens and sharpens the scope on inquiry.
- This can locate subjective experience and collective experience in larger structures and increase how these structures work.

Current Recommendations for Future Study

- Larger Samples from diverse sectors and cultural backgrounds (Chen, 2010)
- How to link KM with HRM Functions (Maqsood, 2009)
- Tangible Intangible economic environmental and social significance of KM on innovation and organisational learning
- Exploration of additional nuances of relationships between knowledge creation approaches (Wan, 2011)
- Realistic work is needed to explore how various experiences play out in the organization, thereby enabling us to better capture the means of attaining quality in a work setting, especially when uncertainty is high. (Erden, 2008)


Research Question
Is Tacit Knowledge Necessary and Relevant in a Digital Age for Innovation in Electrical Engineering ?
Accepted by Curtin University 2014 January

References

- Chen, L. S. (2010). The strategic importance of tacit knowledge management activities in construction. *Construction Innovation*, 138-163. doi:doi:http://dx.doi.org/10.1108/14714171011037165
- Clarke, J. L. (2010) Is On the Job Training effective for ESITO apprentices? *Wintec Research Archive* University of Waikato School of Management Dissertation
- Creswell, J. (2013). *Qualitative Inquiry & Research Design.* New Delhi: SAGE Publications Inc.
- Drucker, P. F. (1993). *Post-Capitalist Society* . New York: Harper Business.
- Drucker, P. (1969). *The age of discontinuity : guidelines to our changing society.* Heinemann London.
- Erden, Z. V. (2008). The quality of group tacit knowledge. *Journal of Strategic Information Systems, 17*, 4-18. doi:doi:10.1016/j.jsis.2008.02.002 Journal of Strategic Information Systems . (n.d.).
- Janhonena, M. , & Johanson, J. (2011). Role of knowledge conversion and social networks in team performance. *International Journal of Information Management, 13*, 217-225.
- Johannessen, A., & Olsen, B.(2011). Aspects of a cybernetic theory of tacit knowledge and innovation. *Kybernetes, 40*(1/2), 141-165.
- Johannessen, J., Olaisent, J., & Olsen, B. (2001). Mismanagement of tacit knowledge: the importance of tacit knowledge, the danger of information technology, and what to do about it. *International Journal of Information Management*, 3-20.
- Lave, J., & Wenger, E. (1991). *Situated Learning, Legitimate Peripheral Participation.* Cambridge.: Cambridge University Press.

- Maqsood, T. A. (2009). A knowledge management approach to innovation and learning in the construction industry. *International Journal of Managing Projects in Business*, 297-307. doi:doi:http://dx.doi.org/10.1108/17538370910949310
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company.* New York.: Oxford University Press.
- Norman, K., & Lincoln, &. Y. (Eds.). (2003). *Strategies of Qualitative Inquiry.* Thousand Oaks, California.
- Polanyi, M. (1967). *The Tacit Dimension.* London, Great Britain : Routledge & Kegan Paul Ltd.
- Ramsey, P. L. (1993) Successful on-the-job training -helping others to learn. Dunmore Press, Palmerston North, N.Z
- ISBN: 0864691831, 9780864691835
- Rowden, W. (2007). *Workplace Learning. Principles and Practice*. Florida
- Krieger Publishing Company.
- Smith, M. K. (2001, 2013). 'Chris Argyris: theories of action, double-loop learning and organizational learning', the encyclopaedia of informal education.[http://infed.org/mobi/chris-argyris-theories-of-action-double-loop-learning-and-organizational-learning/. Retrieved: 21/11/2014]
- Wan, J., Wan, D., Luo, W., & Wan, X. (2011). Research on explicit and tacit knowledge interaction in software process improvement project*. *Journal of Software Engineering and Applications, 4*(6), 335-344. (Wan, 2011)
- Wenger, E. (1999). *Communities of practice: Learning, meaning, and Identity.* New York: Cambridge university press.