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Work-integrated learning in forestry education in South Africa: from theory to practice

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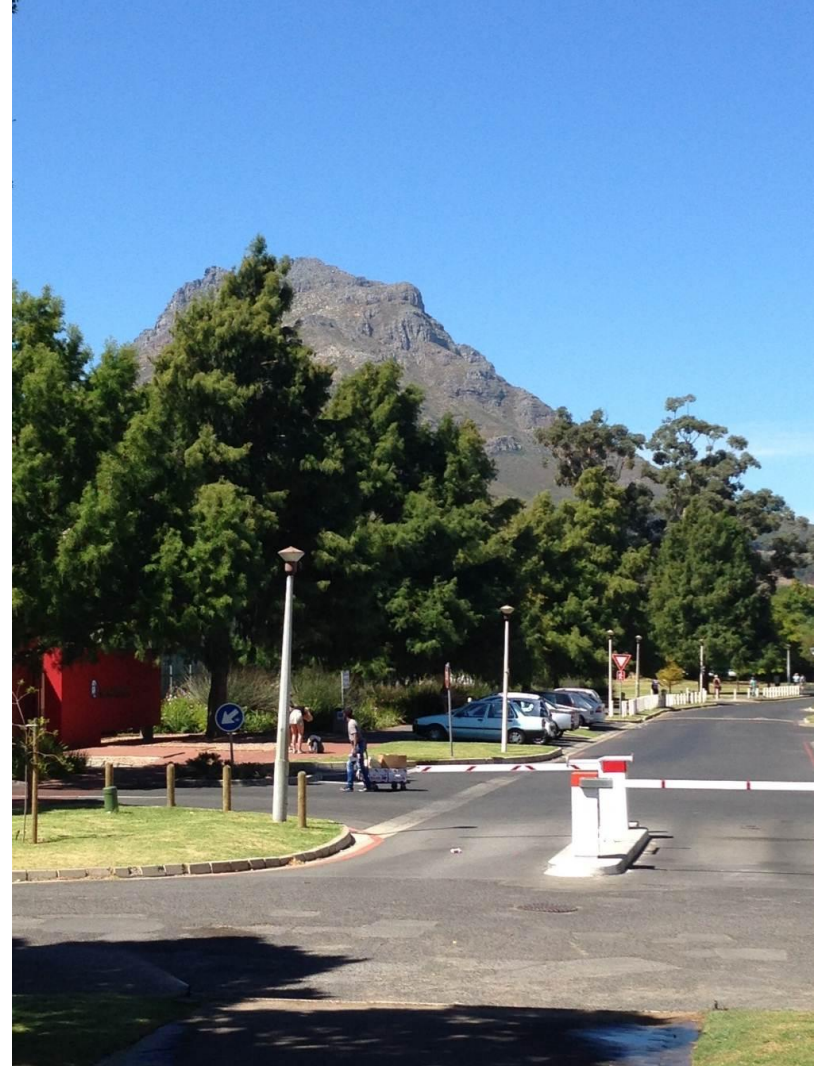




Contents



- Introduction
- Work integrated learning
- WIL and forestry
- WIL @ DFWS
- Student perceptions
- Graduate survey
- Discussion





Introduction

- Universities more involved in society – scholarship of engagement (Boyer, 1996)
 - Teaching, research and community engagement
- Stellenbosch Univ. – community interaction
 - Community – also Forestry Industry
- Department of Forest and Wood Science (DFWS)
 - Enrich industry with scientific knowledge
 - Graduates – forest managers and scientists
 - Qualities of graduates – Work-integrated learning






Work-integrated learning

- Medieval Universities

- Practical “mechanical” disciplines such as agriculture, healing and construction not welcome

- Modern Universities

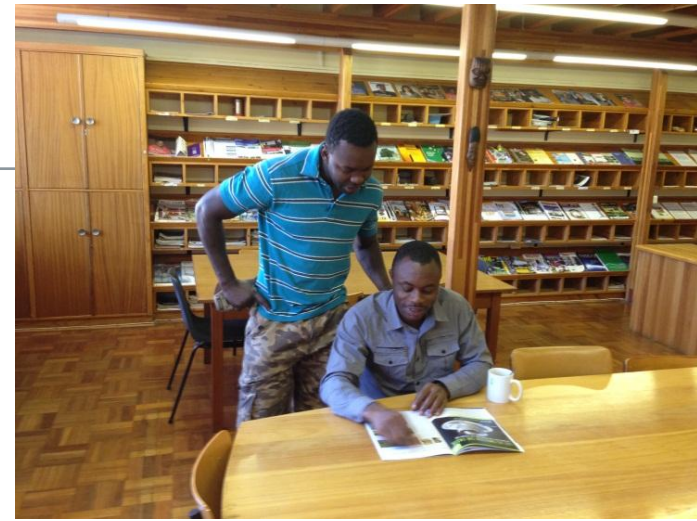
- Business of offering broad and critical education – student engage with “real” world
- Prepare student for suitable career
- Knowledge  Personal skills
- WIL and service learning (SL) – opportunity to combine academic and workplace practices





Work-integrated learning (2)

- Focus on enhancement of:
 - Interdisciplinary thinking
 - Communication
 - Leadership and teamwork skills
 - Technical knowledge
- Help to clarify career expectations, set professional identity, create employment opportunities, create positive work values
- Important for forestry students – managers early in career





WIL typology (Winberg et al. 2011)



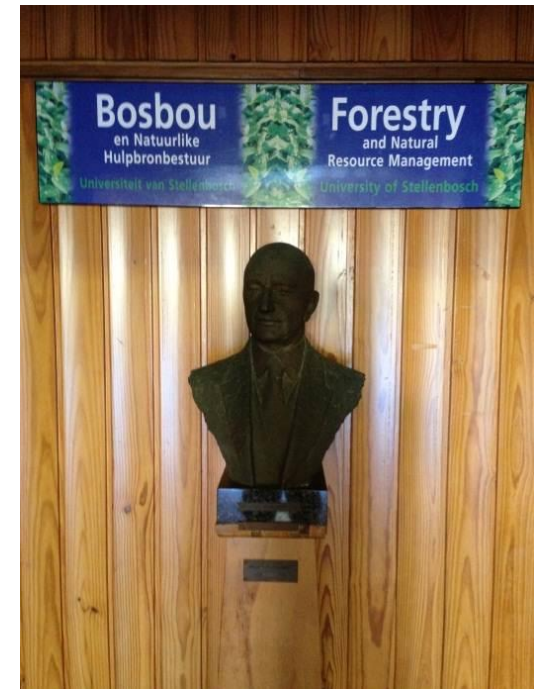
Curricular modality	Work directed theoretical learning (WDTL)	Problem based learning (PBL)	Project-based learning (PJBL)	Workplace learning (WPL)
Terms and practices	Classroom-based instruction, Lectures and tutorials, Peer group learning	Analysis of real world problems, Integrated learning, Discovery learning, Self-directed and peer learning	Industry projects, Real world learning, Guided practice, Capstone modules	In service work placements, Apprenticeships, Internships, Traineeships
Examples	Career focussed curricula, Guest lectures, Authentic examples	Work simulated problems, Case studies and scenarios	Student visits, Site visits, Job shadowing, Fieldwork, Service learning	Learning contracts, Work record books, Learning logs and journals, Mentoring, Learning portfolios
Sites of learning	Lecture theatre, Classroom, Laboratory, Websites and blogs	Classroom, Laboratory, Library, Electronic media	Multiple sites, Classroom, Workplace, Electronic media	Workplace and class room (for preparation and reflection, Electronic media



WIL and forestry in SA



- First professional foresters in SA – 1881
 - Trained at French School of Forestry – Nancy
- Tokai School of Forestry since 1906
 - In 1932 Saasveld School of Forestry
 - Nelson Mandela Metropolitan University (2006)
 - Focus on training foresters with practical work experience
 - 9 month Work Place Learning
- BSc Forestry degree at Stellenbosch 1931





WIL and forestry in SA (2)



- BSc Forestry degree at Stellenbosch 1931
 - Strong science focus – forestry and wood science
 - Train forest managers and scientists
 - WIL integrated since inception
 - 1934 – 8 weeks practical work, management plan, collect herbarium specimens of fungi, insect and trees





Year	Module	Activities	WIL typology
1 - 4	All modules	Practical and tutorials, case studies, field visits in the surrounding forest areas and guest lectures by industry experts	WDTL, PBL, PJBL
1	Forest Science 171 (Introduction to forestry)	“One week of practical work in September is to be completed satisfactorily.”	PBL, PJBL
3	Forest Science 354 (Forest growth and yield science)	“One week of practical work in June to be completed satisfactorily.”	PBL, PJBL
3	Forest Science 364 (Timber harvesting)	“One week of practical work (power-saw course) in September of the second year to be completed satisfactorily.”	PJBL
4	Forest Science 442 (Forestry practical work)	“Three weeks of practical forestry work during the four years of study. Three-week study tour during the winter recess of the fourth year.”	PJBL, WPL
4	*Forest Science 468 (Management plan)	“A study of the total industry or of a chosen or allocated management unit in the industry. A visit of approximately three weeks to the management unit is essential.”	PJBL, WPL
4	*Wood Science 468 (Research project)	“Independent execution of a theoretical and/or practical investigation in any wood science related field, and the submission of a comprehensive research report.”	PJBL, WPL





- Assessment
 - Reports
 - Attendance letters
 - Management plan, research report
- Could consider
 - Journals
 - Blogs
 - Presentation of case studies etc.





Student perceptions



- Student evaluations
 - In general positive
 - Final year management plan highlighted

The management plan is a good way of preparing student for the working life.

I think that the management plan is a critical part of the programme. It allowed me as a student to really put together all that I have learned over the past 4 years. It also gives me a glimpse of what will be expected of you in the workplace.

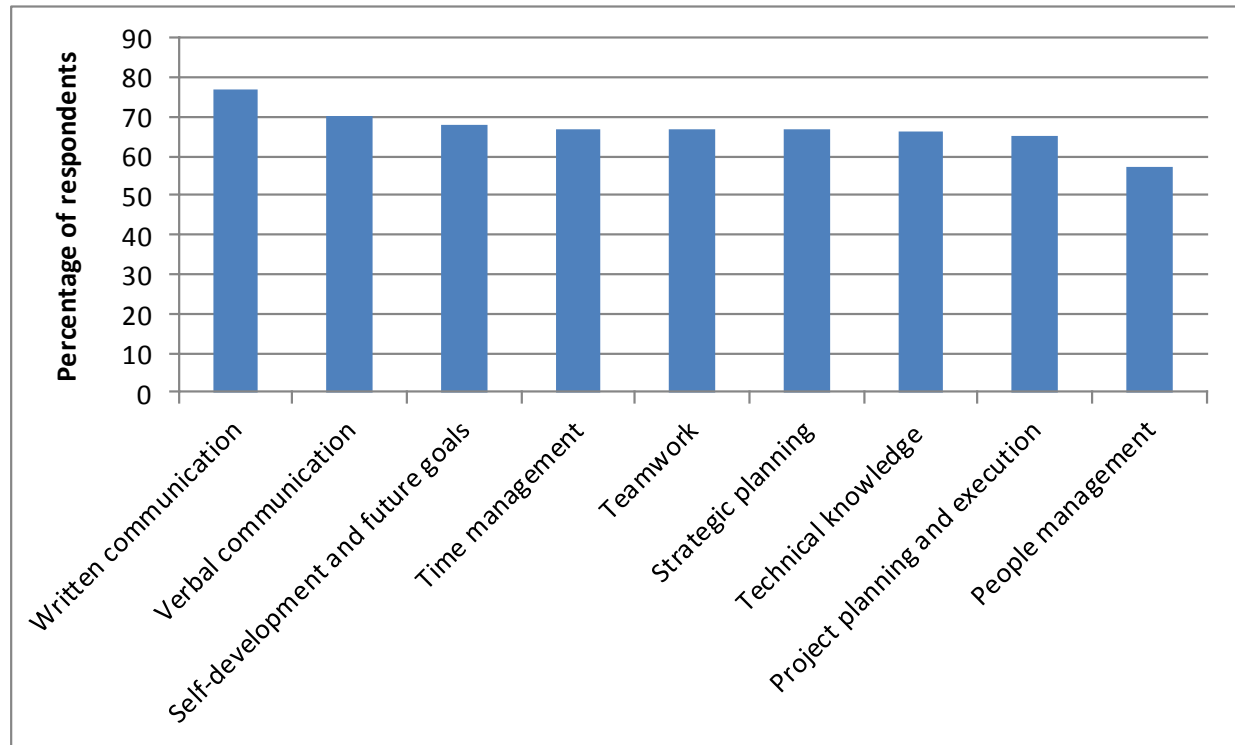
The management plan helped me to bring together all that I learnt in the four year period – it also brought out a confidence in the abilities that I have learnt through my course, which I didn't know I had. I do believe though that the course could be introduced in preview module sections – even if in the form of small tasks. The workload was very high – which would have been more beneficial if we had some knowledge beforehand of the procedures and topics – would have helped us take more from the plan.



Graduate survey – 2010 - 2012



- Sent to 25 graduates – 17 return (6 post-graduate – others working as foresters)
- 67% agreed that BSc Forestry prepared them well for work

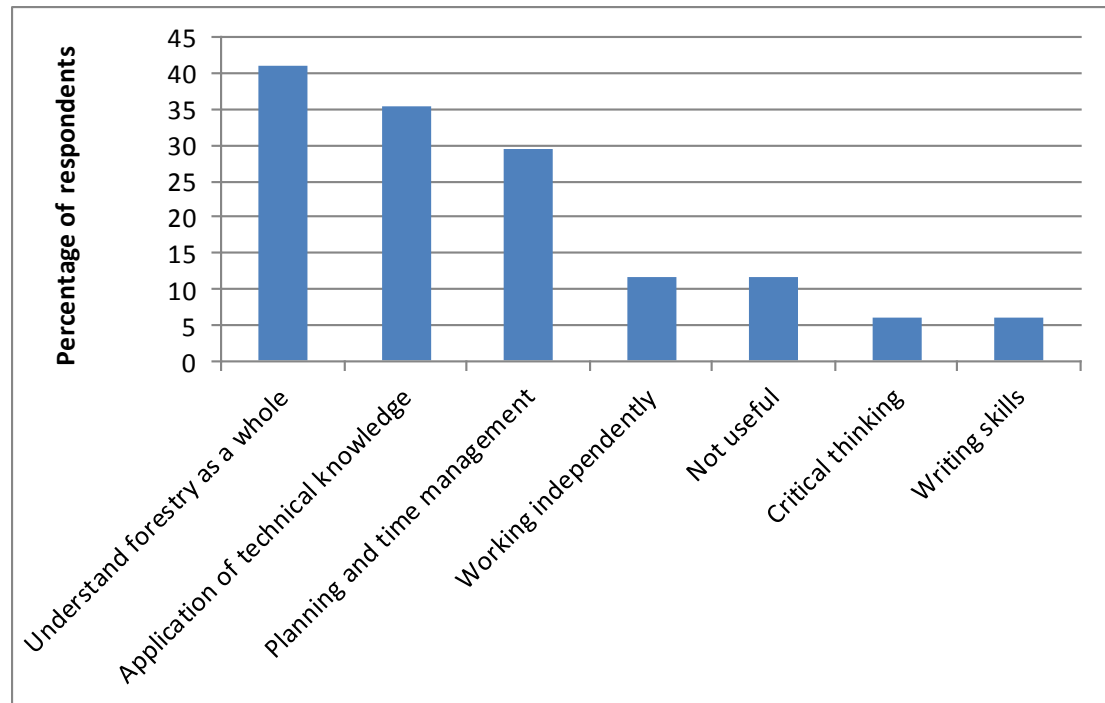




Graduate survey – 2010 – 2012 (2)



- Theoretical knowledge – 76% gave 4 to 5 ranking (1 = not good; 5 = very well)
- Technical knowledge – 47% - 2 to 3 and 41% - 4
- 73% asked for more practical work
- Final year management plan benefits





Graduate survey – 2010 – 2012 (3)



The management plan brings together all aspects of the forest supply chain, giving us a good idea of how the system works as a whole. For postgraduate studies it helped us prepare for practical data gathering and method to reduce huge workloads into smaller sections. It also gave us a gauge of how time consuming the writing up process could be, and therefor helped with planning.

The planning and systematic production of such a big management document forces one to have long term aims while at the same time having to carry out daily steps in order to reach those goals. It teaches you to break down a bigger task in smaller achievable tasks. It also taught me to work on my own although I would have preferred closer supervision.

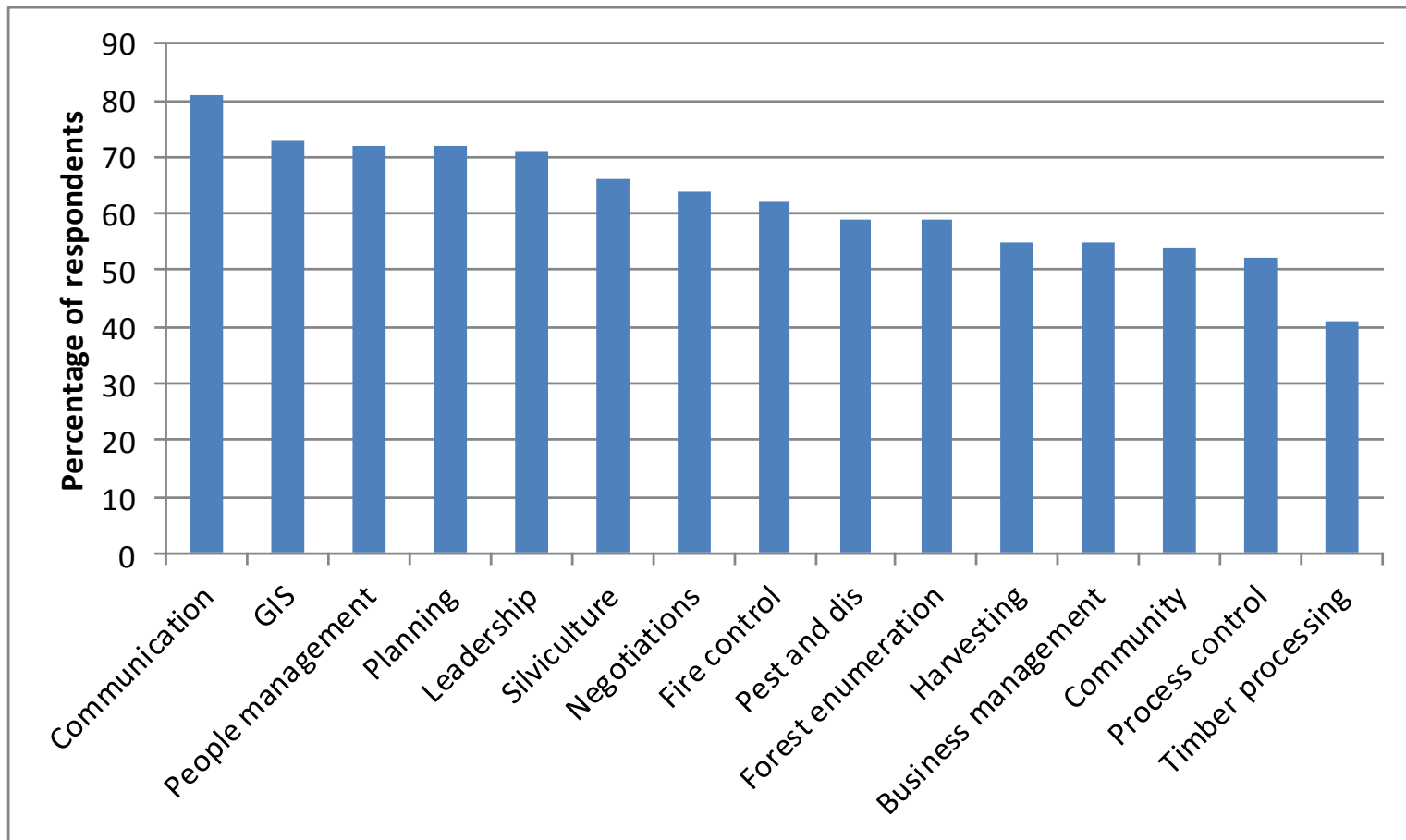
The management plan has been incredibly helpful in so many different ways. It has taught me to work under pressure and to handle large volumes of a diverse nature. Roads Planning, costing, scheduling and phasing, keeping track and general exposure to concepts and terminology and an understanding of how everything fits together were just some of the benefits I can pick out. I think I would have battled a lot more adjusting to the work environment without the opportunity of doing a management plan.



Graduate survey – 2010 – 2012 (4)



- Work related topics

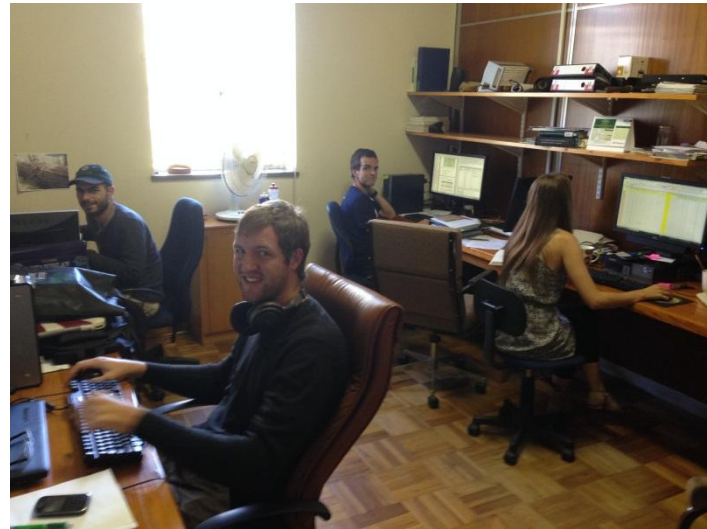




The forestry workplace



- Forestry business environment becoming increasingly complex
 - Technical skills often second place to qualities such as being able to work well with other foresters and with public stakeholders (Jacobson *et al.* 2008)
- Can more be done to create a graduate who can adapt to the complexities of the forestry environment?
- More WIL or better WIL?





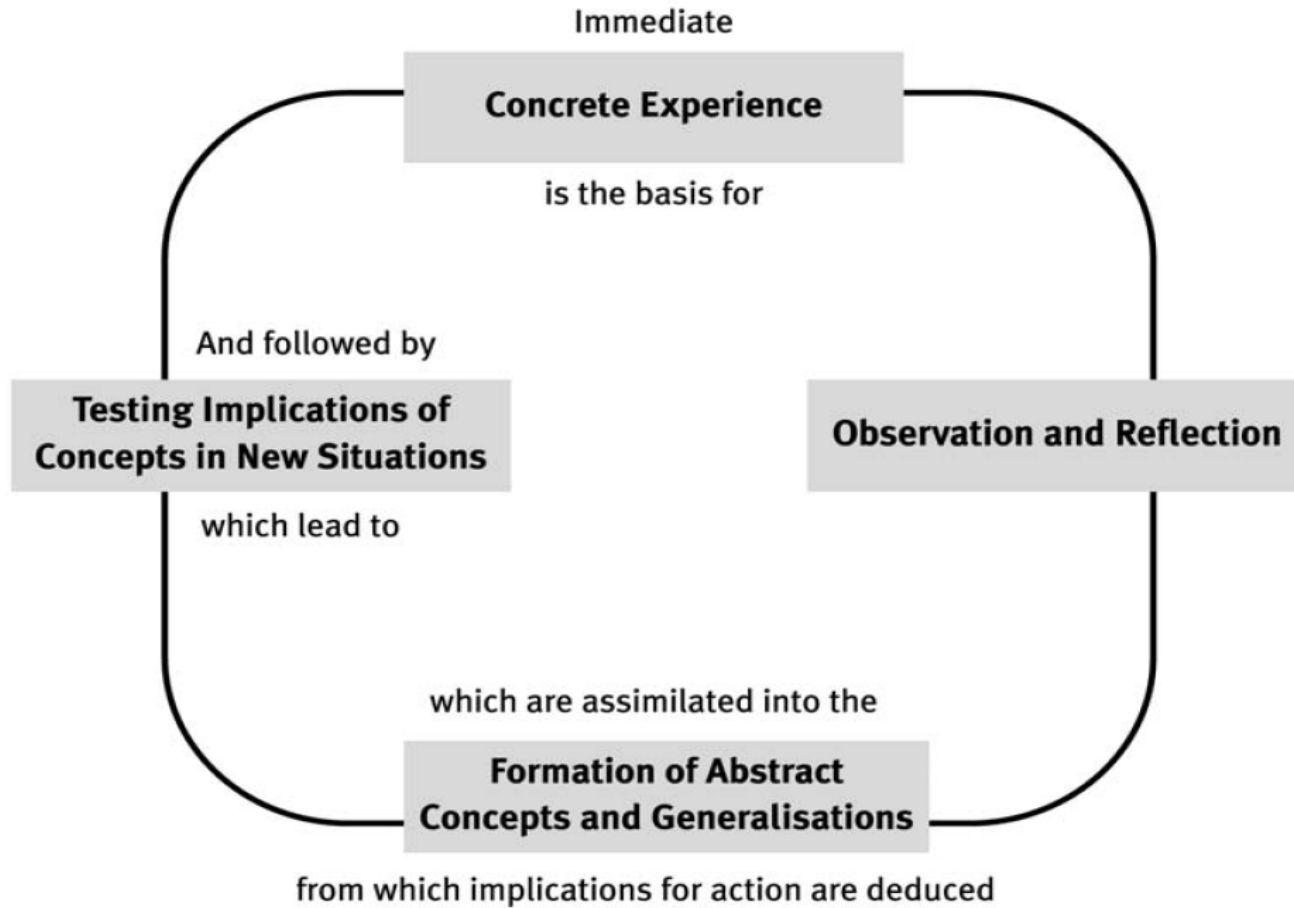
Better WIL

- WIL activities focus on exposing students to workplace elements
- From alumni feedback - seems not sufficient guidance in this process
- Kolb's Experiential Learning Cycle (Kolb 1984)
practical experience ➡ reflective observation ➡ abstract conceptualization ➡ active experimentation





Kolb Experimental Learning Cycle (1984)





Better WIL

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- From alumni feedback seems not sufficient guidance in this process
- Kolb's Experiential Learning Cycle (Kolb 1984)
practical experience ➡ reflective observation ➡ abstract conceptualization ➡ active experimentation
- Reflection is component of learning that generates meaning, new questions and enhanced understanding of practice





Conclusion

- WIL - emphasis on process of learning as opposed to mere measurement of outcomes
- Knowledge created through transformation of experiences
- Help to contextualize theoretical knowledge and add to the personal development of graduates
- Foresters will have to be engaged citizens, dynamic professionals and well-rounded individuals

