European Journal of Engineering Education

ISSN: 0304-3797 (Print) 1469-5898 (Online) Journal homepage: http://www.tandfonline.com/loi/ceee20

# Scholarship of teaching and learning: 'what the hell' are we getting ourselves into?

Arthur James Swart, Nicolaas Luwes, Lienie Olwagen, Cameron Greyling & Carel Korff

**To cite this article:** Arthur James Swart, Nicolaas Luwes, Lienie Olwagen, Cameron Greyling & Carel Korff (2016): Scholarship of teaching and learning: 'what the hell' are we getting ourselves into?, European Journal of Engineering Education, DOI: 10.1080/03043797.2016.1214689

**To link to this article:** http://dx.doi.org/10.1080/03043797.2016.1214689

Published online: 01 Aug 2016.

EUROPEAN JOURNAL OF ENGINEERING EDUCATION, 2016
http://dx.doi.org/10.1080/03043797.2016.1214689

Taylor & Francis
Taylor & Francis Group

# Scholarship of teaching and learning: 'what the hell' are we getting ourselves into?

Arthur James Swart, Nicolaas Luwes, Lienie Olwagen, Cameron Greyling and Carel Korff

Faculty of Engineering and Information Technology, Central University of Technology, Bloemfontein, Free State, South Africa

**ABSTRACT**

Academics must be encouraged to reflect on their teaching, to apply new pedagogies to support student learning and to report on the results of these actions, which really forms part of programmes relating to Scholarship of Teaching and Learning (SoTL). However, there seems to be resistance among some academics to get involved in these programmes due to fear of change or discrimination. The purpose of this article is to highlight the perceptions of four academics from different engineering fields towards such a programme from a University of Technology in South Africa. A qualitative study is employed where a focus group interview was used to gather data which are correlated to the SoTL unicycle detailed in the article. A benefit of joining an SoTL programme includes 'developing a teaching action plan' while a key challenge relates to time concerns. An implication may be to stimulate awareness among non-participating academics about what an SoTL programme really engenders.

**ARTICLE HISTORY**
Received 28 October 2015
Accepted 13 July 2016

**KEYWORDS**
Perceptions; benefits; challenges; principles



## Introduction

'A good head and good heart are always a formidable combination. But when you add to that a literate tongue or pen, then you have something very special' (Brainy Quote 2015). These words, by late former president Nelson Mandela of South Africa (SA), well convey the importance of a good head (or then a reflective mind), a good heart (or then a desire to support others) and a literate tongue (or then a sharing disposition). These three key aspects (reflection, support and sharing) are key underlining principles of the Scholarship of Teaching and Learning (SoTL), which Illinois State University (2015) defines as the 'systematic reflection on teaching and learning made public'. Continuous engagement with SoTL is the hallmark of a good teacher, as it helps to select the most appropriate pedagogy, providing the framework for classroom assessment (Gurung and Wilson 2013). Progressing to the level of an effective academic with a reflective mind, a heart's desire to support student learning and an eagerness to share experiences with others requires personal commitment and dedication to SoTL.

However, there seems to be resistance, or at least reluctance, among some academics to get involved in programmes relating to SoTL. McKinney (2007) lists 10 common concerns and sources of resistance to SoTL, including the fact that SoTL work will not be adequately valued and rewarded on campus or in the discipline. This concern prevents many academics from devoting time and effort to SoTL, as they feel that there will be no real benefits in the long run. For example, some policies on academic promotion indicate that academics may only include their research outputs that are directly related to their specific discipline (Central University of Technology 2015). This implies that, in the case of Electrical Engineering, only research outputs in that field specific discipline will

**CONTACT** Arthur James Swart drjamesswart@gmail.com

be considered for promotional purposes, with no consideration given to research outputs in the field of education. Subsequently, academics in these circumstances feel that they need to devote their time and energy to research in their field-specific discipline, rather than in SoTL, in order to qualify for future promotion which will influence the quality of their life.

Quality of life concerns individual (physical and psychological health), interpersonal (social relationships) and contextual (environment) aspects, which are both subjective and objective (Fassio, Rollero, and De Piccoli 2013). Physical and psychological health relates to the standard of life which an individual enjoys, which is often influenced by the level of education. Individuals who have no higher educational qualification often have to engage in two or three occupations in developing countries (defined as low- and middle-income countries (Bettin, Presbitero, and Spatafora 2014)) just to put food on the table, which takes a toll on their physical and psychological well-being. Their physical and psychological health is particularly threatened by their living conditions (Tinnemann et al. 2013), which may be equated to their environmental (contextual) aspects. If they fall into the low-income group, then their living conditions may often be characterised by government subsidised housing, shacks made of scavenged materials, prefabricated dwellings and non-residential buildings. These contextual aspects may further impact on one's social relationships (interpersonal aspects). Social relationships are particularly important for people with low social status to compensate for other shortages that are derived from their personal circumstances (Makai et al. 2015). One's quality of life may therefore be directly correlated to ones level of education (Kivits, Erpelding, and Guillemin 2013), being both formal (credit bearing qualifications) or informal (non-credit bearing qualifications).

Universities must enable students to acquire a formal qualification, where the necessary knowledge (theory), workplace skills (practice), and more importantly, graduate attributes (theory and practice) must be demonstrated by these students (Swart et al. 2014), if they are to be accepted by industry or academia. Consequently, job training and educational programmes must be enhanced in order to adequately prepare all students to join the labour force (Halter 2015). It must be emphasised that education is neither static nor restrictive, but rather dynamic and ubiquitous. This dynamism is especially evident among academics that engage with SoTL, as they are open to, and indeed actively seek to implement, new and creative strategies for education (Hutchings, Huber, and Ciccone 2011). Research articles have reported on the perceptions of academics regarding SoTL, as these academics seek to engage more fully with it in the U.S.A. and Australia (Marcketti, VanDerZanden, and Leptien 2015; Mathison 2015). However, very little has been published on the perceptions of engineering academics in SA regarding the implementation of SoTL at a University of Technology. The following research question therefore arises 'What are the perceptions of engineering academics to an SoTL programme which they were asked to engage in at a University of Technology in SA?'

The purpose of this article is to highlight the perceptions of four academics from different engineering fields towards an SoTL programme which was started in a research group in engineering education (termed ARGEE) at a University of Technology in SA. Reasons for engaging in SoTL are sought, along with its benefits. The importance of SoTL is firstly discussed; the SoTL unicycle is introduced in an effort to help new academics come to terms with what SoTL really engenders. The methodology follows along with the qualitative results which include the background of the academic staff who participated in this research (including a brief teaching philosophy from each one) as well as the results of the focus group interview. Discussions and conclusions end the article.

## Theoretical framework

Boyer first introduced the concept of SoTL in 1990 in 'Scholarship Reconsidered', to complement the scholarship of discovery, integration and application (1990). However, academics were slow to adopt SoTL, which still had not been fully defined or conceptualised at the start of the twenty-first century (Bass 1999). This has changed in recent years as a plethora of definitions have arisen in an attempt to

assist academics gain a deeper understanding of what SoTL really engenders. For example, in 2009, SoTL was defined as the systematic reflection or study of teaching and learning made public (McKinney and Jarvis 2009) while in 2012 it was further defined as the study of teaching and learning and the communication of findings so that a body of knowledge can be established (Bishop-Clark and Dietz-Uhler 2012). The most recent definition states that SoTL is the scholarly inquiry into student learning which advances the practice of teaching by sharing this research publicly (Peltz 2015). Time and space do not allow one to present and discuss all the different definitions of SoTL that have arisen over the past decade. However, what is important to note is that SoTL is based on the construct that a focus on effective teaching contributes to more effective student learning (Engin 2014). Therefore, the more academics actively engage with SoTL, the more effective they will become in their teaching with a corresponding boost in student learning. Conducting SoTL is the hallmark of a good teacher (Gurung and Wilson 2013), where inquiry into student learning can inform and enhance teaching practice, leading to improved student learning (Prosser and Trigwell 2009). The ultimate goal of SoTL is to improve learning (Wankat et al. 2002), and it must therefore be championed by all institutions of higher learning. SoTL should not be a luxury for only certain academics, but must rather be seen as an essential and continuous investment in the human capital of every institution (Bernstein 2013).

How SoTL is defined is critical to how SoTL is interpreted within discipline contexts, with some models and definitions transcending disciplinary boundaries. There is no single agreed definition of what is meant by SoTL (Quinnell et al. 2010). However, there are key principles, tenets or spokes that underpin SoTL. When drawn together, these spokes have the potential of enlightening academics from all disciplines as to the true meaning of SoTL. Eight key spokes make up the SoTL unicycle, as shown in Figure 1, and are discussed in the following sections. It must though be emphasised that using the SoTL unicycle requires practice, time and effort. Mastering SoTL does not occur over night, but requires constant dedication and commitment to teaching and learning over an extended period of time. The SoTL unicycle further suggests that only one person can ride it at any given time, implying that one needs to engage with and improve one's own teaching practice, and not that of someone else's! Moreover, riding a unicycle requires balance. One needs to balance the requirements of SoTL with other academic responsibilities, not becoming side-tracked by any given responsibility. Lastly, the effort put forth brings rewards. The joy and satisfaction of eventually mastering the unicycle is similarly experienced by those who master SoTL. These rewards include improved teaching practice, enhanced student learning, recognition of teaching excellence, financial incentives and career progress. SoTL can serve as a tool for faculty development (Gurung and Wilson 2013) and can rightly claim a place in faculty reward systems (Dewar and Cohn 2010).

The first spoke of SoTL is *awareness*. Generally, awareness refers to someone having knowledge of something after becoming mindful of its existence, or being well informed about the current development of a particular activity (Sheau Ting, Hakim Bin Mohammed, and Wai Choong 2012). Some of the most effective ways of fostering awareness among fellow colleagues is by word of mouth and by achievements. Academics who join an SoTL programme are empowered with knowledge and attributes which they may take back to their departments, sharing them with colleagues through both formal and informal discussions. However, the most powerful way of fostering awareness lies in the achievements of the participants. Colleagues become aware of members achievements in the SoTL, through institutional newsletters, research platforms (such as Research Gate or Google Scholar), teaching and research awards, conference attendances and institutional committees. It is therefore vital that all members of an SoTL programme be actively engaged with its various spokes, in order to really foster awareness among fellow colleagues. However, awareness of SoTL also includes another aspect, that of being personally aware of the latest literature in this field of research. Yes, SoTL academics need to keep up with recent publications in this field, attend workshops relating to its successful implementation and engage with fellow researchers at SoTL conferences. Only then can an academic begin to engage fully with the following spoke of SoTL, namely reflection.

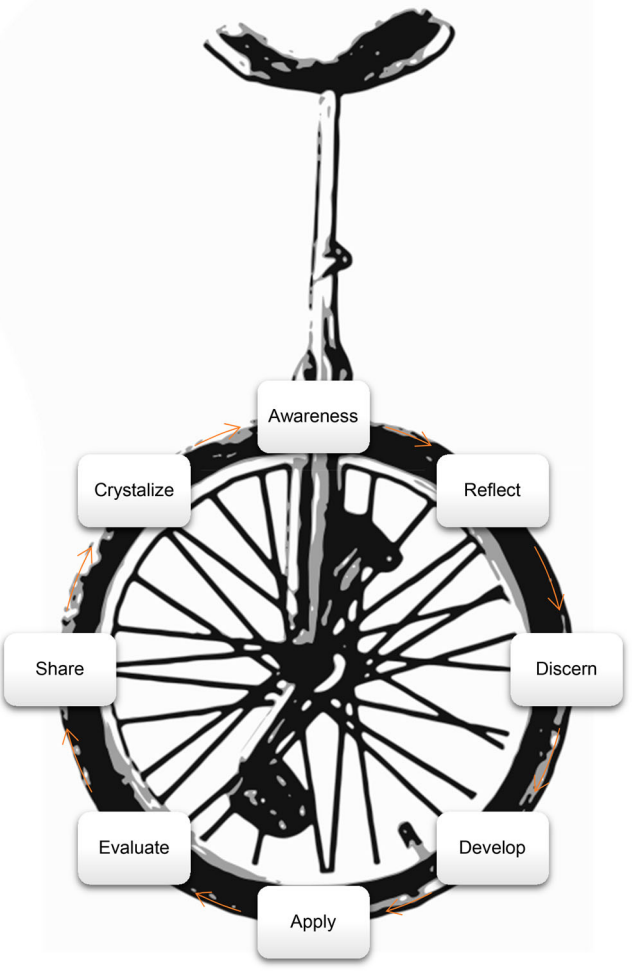


**Figure 1.** The SoTL unicycle.

Trigwell et al. (2000) clarify three elements of SoTL, with the first element being the engagement with the contributions of others towards SoTL. This may be discerned as the spoke of awareness, discussed previously. The second element is the reflection of one''s own teaching and learning while the third element is sharing processes and outcomes with others. *Reflection* provides opportunities for personal growth and development, as one reflects on one's own weaknesses and strengths. Academics furthermore need to reflect on the background and prior learning experiences of their students before attempting to design or update a curriculum that will support student learning. Added to this is the need to reflect on current pedagogies which have been successfully applied to support student learning. Reflection on these aspects must lead to the third spoke of SoTL, namely, that of discernment.

The term *discernment* relates to key notions in ancient Greek philosophy, such as judgment, prudent decision-making, conscience, rationality and wisdom (Hermans and Koerts 2013). Yes, academics in an SoTL programme need to prudently decide on what are the gaps, challenges and critical issues (module weaknesses) which need to be addressed in a specific engineering educational programme. SoTL means that individuals investigate a specific issue that has relevance to them by using the experience and knowledge of others, in addition to what is available in the formal literature (Albers 2008). Course throughput rates, study guides, student perceptions, industry feedback and

updated institutional policies are also important sources to consult during this process. However, academics also need to decide on what pedagogies are working well in their field, and then seek to strengthen them. Ways of bridging gaps, mitigating challenges, solving issues and augmenting programme strengths are sought by reflecting on recently published papers and journals in SoTL. Action plans must then be developed to address the concerns (Maes 2014).

To *develop* implies change (Kivitalo, Kumpulainen, and Soini 2016). Yes, academics need to change their way of teaching to reflect current trends in education. Indeed, SoTL includes reflecting on ideas and suggestions for the next step in the evolution of the practices (Bernstein 2013). Teaching practice needs to evolve and improve through continuous change. Developing an action plan therefore involves asking questions such as 'how must the change be affected' and 'when must it be done'. Recall that the reasons for the change have already been identified in the previous spoke, termed discernment. The following SoTL spoke that must be followed is termed apply.

Once the action plan has been developed and approved, it must be *applied* or implemented to bring about meaningful change (Glenn 2014). Applying the action plan requires time, effort and accurate record keeping. New learning outcomes and assessment strategies may need to be implemented, as well as new pedagogies such as problem-based learning, authentic learning, active learning or the flipped classroom which will require extra time and effort by the academic. The results of implementing the action plan must be recorded as evidence, so that it may be ascertained if the weaknesses and strengths (programme and one's own teaching practice) have been addressed. SoTL is, at its core, an approach to teaching that is informed by inquiry and evidence (both one''s own, and that of others) about student learning (Price and Kirkwood 2014). Developing and implementing a plan of action must be followed by evaluating the effects of our actions (Silva-Martinez 2015).

*Evaluation* of a plan entails (after its execution) a subjective assessment of the plan against some performance criteria (Zamfirescu and Candea 2011). The performance criteria are related to the original gaps, challenges and critical issues which were discerned in the third spoke of the SoTL unicycle. For example, a gap may have been discerned in that the practical instruction in a laboratory was not really integrated with the theoretical instruction provided in a classroom. A new set of practical experiments may have been developed and applied within the specific module. Student perceptions of these new experiments as well as student grades may be gathered and then evaluated to see if the original gap has been bridged or closed. The development, application and evaluation of the plan must now be shared with the greater academic community.

This may be correlated to the third element of SoTL mentioned by Trigwell et al. (2000), namely *sharing* processes and outcomes with others (this is the seventh spoke of the SoTL unicycle). This is indeed a key aspect of SoTL, namely the commitment to open and inclusive dissemination of scholarly inquiry, making pedagogic research findings public and open to scrutiny (Holgate and Sara 2014). SoTL requires a community, some artefact or product that must be shared, exchanged and critiqued. This sharing may occur by means of conferences, journals, workshops, seminars, blogs, lectures, study visits, etc. Sharing one' awareness, reflections, plan development, application and evaluation with the global academic community helps to crystallise the entire process for the SoTL participant, while providing meaningful feedback from peers to further refine and improve the pedagogy.

*Crystallise* may be defined as making or becoming definite and clear (Oxford Dictionary 2013). Crystallisation of what SoTL really engenders takes place as one engages more and more with the SoTL unicycle. Repeating the cycle over and over again may be likened to the wheel of an actual unicycle that turns over and over again. This repetitive action results in the strengthening of synapses in one's mind that causes memories to be stored for a lengthy period of time. These memories may serve academics well over many years, as they draw on their experiences and skills in an effort to improve their teaching practice and student learning.

Successfully riding a unicycle requires much practice, time and effort. Similar, to engage regularly with the eight spokes of the SoTL unicycle also requires much practice, time and effort. However, the

four spokes termed *develop*, *apply*, *evaluate* and *share* would require the bulk amount of time and effort. These would often include months of research, as a specific action plan may be implemented over a semester or even year period, with the final summative grades of the students being evaluated and documented in a conference paper or journal article. It requires time and effort to prepare high-quality learning objects (Sjoer and Dopper 2006) while writing and finalising a publication may require nine times the effort of reviewing a publication of the same scope (Cutting 2007). Undoubtedly, writing a publication requires much more time and effort than one might initially predict (Edwards 2010), even within SoTL.

Experience has shown that inside the house of SoTL, teaching lives upstairs and learning in the basement (Maphosa and Wadesango 2014). This perception may be adjusted when academic staff members are made aware of what SoTL really engenders. The concept of SoTL may mean a lot of different things to academic staff members which should be clarified (Maphosa and Wadesango 2014), and this may be achieved by using the SoTL unicycle. Clarifying the definition of SoTL will lead to it being understood, accepted, valued and applied to promote the practice of teaching and learning (Li 2014). This clarification was sought by the first participants in a research group relating to SoTL at Central University of Technology (CUT) during 2014.

## Research methodology

This research employs a qualitative study where a focus group interview is used. Greenbaum (1993, 45–49) defines a focus group interview as a focused discussion where a moderator leads a group of participants, usually ranging from 5 to 12 people, through a set of questions on a particular topic. A *focus group interview* is a useful research tool when the researcher does not know much about the participants and thus provides rich and detailed information about feelings, thoughts, understandings, perceptions and impressions of people in their own words (Liamputtong 2011, 6). Focus group questions need to be open ended in order to generate as much discussion as possible, being phrased with words such as who, why, what, when and how (Rubin and Babbie 2013, 114). Good focus group questions often begin with such phrases as, 'How do you feel about … ', 'What is your opinion of … ' or 'Please describe … '. A single session can be used in studies where the population of interest is very small (Wholey, Hatry, and Newcomer 2010, 356–359).

The questions were derived from previous research focusing on the perceptions of academics towards SoTL (Lanning et al. 2014; Marcketti, VanDerZanden, and Leptien 2015; Mincer and Hessinger 2012; Secret et al. 2012) and from the literature informing the eight spokes of the SoTL unicycle. The link between the SoTL unicycle and the questions used in the interview is detailed in the discussions section of this article.

The target population is restricted to four engineering academics that joined ARGEE during June 2014 and who subsequently participated in HELTASA2014 (an annual national educational conference in SA). A single session was held with these participants to ascertain their feelings as to what prompted them to join the engineering education group. Participant thoughts about what may hinder their fellow colleagues from joining the group were also sought. The session was limited to 40 minutes and was recorded for future in-depth analysis.

## Results: academic staff profiles

Table 1 presents succinct information regarding the first four academics that joined a research group in engineering education (termed ARGEE) during 2014. This research group is affiliated to the SoTL programme which was officially launched at CUT during 2015. This programme was made possible by funding obtained from the Teaching and Development Grant (TDG) awarded to CUT by the Department of Higher Education and Training (DHET). The main objective of the programme is to help new participants engage with the spokes of SoTL, creating a community of practice to benefit both students and the institution.

**Table 1.** Staff members who joined the ARGEE group and participated in HELTASA2014.

| Acronym | Staff member's department | Number of years in academia | Number of conference papers |
|---|---|---|---|
| SM1 | Built Environment | 3 | 3 |
| SM2 | Civil Engineering | 19 | 1 |
| SM3 | Electrical, Electronic and Computer Engineering | 10 | 2 |
| SM4 | Mechanical Engineering | 6 | 4 |



SM1 is currently a Junior Lecturer in the Department of Built Environment at CUT, having received a B.Sc. in Quantity Surveying in 2010. SM1 has presented a number of research papers at national conferences over the past few years and is currently enrolled for an M.Sc. in Quantity Surveying. This member of ARGEE matriculated from Sentraal High School in 2006, which is an Afrikaans medium school located in the northern suburbs of Bloemfontein (average school size of around 1000 learners). SM1 immediately started studying towards a degree in Quantity Surveying, which was planned earlier on as a career choice. In 2011, SM1 joined a professional Quantity Surveying firm and started lecturing part-time at the CUT in 2012. SM1 has lectured two different modules over the past three years. A part of the teaching philosophy of this member states that it is important

> to make a concrete difference in someone's life and 'education' is where the greatest impact can be made. Creating an environment of acceptance and equality for students is empowering oneself and the candidate. Students must feel free to ask questions without judgement. My personal believe is that enthusiasm for teaching, students and the subject matter is crucial, as a love for human empowerment motivates me to improve myself.

SM1 lists life-long learning as critical to professional development within the teaching profession, while stating that learning should be fun. SM1 firmly believes that students must take ownership of their learning and be active participants in the learning process, while lecturers must engage with students, creating an environment that is conducive to effective learning.

SM2 is currently a Lecturer in the Department of Civil Engineering at CUT, having received a Higher Diploma in Civil Engineering (NH.Dip) in 1992. SM2 presented a conference paper at the HELTASA2014 conference, and is currently studying towards a Master's degree. This member of ARGEE matriculated from Newcastle High School in rural Kwa-Zulu Natal in 1975. This was a large model C-school (1000+ learners), offering classes in both Afrikaans and English. SM2 originally planned to become a town planner, but changed the anticipated career path to that of a high-school teacher, with Geography and Psychology as primary subjects. However, this was interrupted in 1979 with entry into the Defence Force of SA for compulsory national service. Then, in 1981, this member of ARGEE joined ISCOR and complete practical training in welding, fitting, electricity, plate work and bricklaying. SM2 went on to work for Early Bird Farms (Pty) in Standerton, Jeffares & Green Consulting Engineers in Bloemfontein and the Provincial Government. In 1996, SM2 finally entered higher education as a lecturer, and presented 18 different modules over the next 19-year period. A part of the teaching philosophy of this member states that it is vital

> to be in a position of informing, inspiring and guiding our youth into a position where they can provide real value to their communities. This gives me definite satisfaction and a sense of achievement. To help shape our youth into the best technical role players they can be, and to see their dreams and aspirations being achieved, provides me with and amazing sense of fulfilment.

SM2 firmly believes that important attributes of an effective academic teacher include passion for people AND for one's field of specialty, patience, professionalism and a pretty good sense of humour!

SM3 is currently a Senior Lecturer in the Department of Electrical, Electronic and Computer Engineering at CUT, having received a D.Tech. in Electrical Engineering in 2010. This member of ARGEE has presented a number of conference papers over the past few years and is currently an active researcher in the field of Computer Engineering. SM3 matriculated from High School Jim Fouché in Bloemfontein in 1997 that was a large model C-school (around 1000 learners) offering classes only in Afrikaans. This member of ARGEE planned to become a lecturer in electrical engineering,

and therefore progressed quickly through the different levels of higher education (National Diploma to D.Tech. within 12 years). SM3 was appointed as a supplementary instructor at CUT in 1999 and went on to lecture seven different modules over the next 17 years. A part of this members teaching philosophy states 'that as a lecturer in engineering, I have the ability to produce many engineers that can improve the economy of the country'. SM3 believes that in industry one is limited as to what can be produced, but at a university, one has access to many new technologies and can even develop new innovations.

SM4 is currently a Lecturer in the Department of Mechanical and Mechatronics Engineering at CUT, having received her M.Eng. degree in Mechanical Engineering in 2015. This member of ARGEE has presented four research papers at national and international conferences over the past few years. After matriculating from an Afrikaans medium school located in Bloemfontein in 2003, SM4 enrolled for a B.Eng. degree in Mechanical Engineering at the North West University in Potchefstroom. In 2008, this member started a professional career at a Mechanical Engineering consulting firm in Durbanville, Cape Town. Although the two years' work experience was greatly enjoyed by SM4, an inner desire to work with and positively influence the lives of others gave birth to an academic career at CUT. This investment into people's lives has been realised by the member who has lectured five different modules over the past six years. A part of the teaching philosophy for SM4 states:

> Your profession is not what brings your final paycheque, it is what you were put on earth to do with passion and integrity that actually becomes your spiritual calling. I strive to teach students in such a manner that it will shape them to reach their full potential in life as a mechanical engineer.

SM4 believes that it is vital that engineering education must enable students to apply their theoretical knowledge in practice, thereby necessitating the use of real life examples in the classroom environment. This member of ARGEE firmly believes in an interactive classroom where students can participate in the learning experience.

## Results: focus-group interview

Twelve questions were posed to the four participating academics, and were drawn from literature relating to the SoTL unicycle. These questions are stated one by one with the answers from the participating academics.

### *Question 1: Why did you become involved in the Scholarship of Teaching and Learning (SoTL) at CUT?*

'I was told by my head of department to represent the department' – This participant was clearly delegated to do so, with no voluntary choice. Another participant replied 'I saw it as a way to get involved in research and to see how to do it.' 'It ties up with my academic studies' was uttered by a third participant while a fourth stated 'It was a way of getting assistance in writing articles.' The last three comments indicate that a voluntary choice was made to join the research group so as to improve the participant's research and writing skills.

### *Question 2: Why do you think some of your colleagues have not joined our SoTL group?*

Two participants said 'They are afraid of extra work and see the SoTL programme as an add-on to their current responsibilities.' Two other views that were expressed are 'It is time consuming to other colleagues' and 'Education is just not a science for them.' The first three comments suggest that other colleagues want to just do the bear minimum, while the fourth comment revealed that other colleagues do not view education as dynamic or worthy of inquiry.

### *Question 3: What benefits have you reaped from joining our group?*

Three positive comments were made; 'I have been able to complete my IPMS, improve my CV and travel to conferences to share my research'; 'I have developed an action plan' and 'I belong to a dynamic research group.' A less positive comment was 'It keeps my head of department off my back.' The positive comments suggest that the participants have started engaging with the SoTL unicycle in terms of sharing research, developing an action plan and reflecting on the group's activities. The fourth comment suggests that this participant may need some more time to engage more fully with the SoTL unicycle to start realising the tangible benefits that come therefrom.

### *Question 4: What do you think are you colleagues missing out on in our group?*

'Opportunities to travel', 'Opportunities to publish', 'Photo memories' and 'The possible improvement of their teaching practice'. These comments illustrate that tangible benefits are derived from engaging with SoTL, benefits which are missed by those who fail to join an SoTL programme. The last benefit, mentioned by one of the participants, has been noted extensively in SoTL literature (Jaffri, Samah, and Tahir 2014).

### *Question 5: What challenges did you face in joining our group?*

'Learning to do research from a social science point of view' and 'Fitting the SoTL activities into my current routine' were the two comments made by the four participants. This highlights that research in engineering is somewhat different from research in education, requiring appropriate mentoring to assist new SoTL engineering members to bridge the research gap between these two different disciplines.

### *Question 6: What challenges do you think may hinder some of your colleagues from joining our group?*

'Anything that looks like extra work', 'Failing to see the perks of the program', 'Feeling overburdened' and 'Lack of awareness' were cited by the four participants. The lack of awareness of what SoTL really engenders and what tangible benefits come therefrom need to be conveyed to academics staff in order for them to look beyond the extra work that is required by SoTL programmes.

### *Question 7: How could we raise awareness about what our group does?*

Three participants stated 'Use the annual reports which are submitted to the quarterly Faculty Board Meetings' while the fourth participant stated 'Do a presentation at the annual research seminar of what our group has accomplished.' The first suggestion may prove more effective than the second, as more faculty staff members tend to support the Faculty Board Meeting than the annual research seminar.

### *Question 8: What efforts would your colleagues not be willing to make with regard to our group's activities?*

'Time', 'They will make no efforts if they see no tangible results', 'Reluctance to do research' and 'Resistance to change'. Resistance to change is often associated with the unknown (Yılmaz and Kılıçoğlu 2013), which again indicates that awareness of what SoTL really engenders and produces is required if academic staff are to join an SoTL programme. This will help future participants to realise the tangible benefits that come therefrom which are worth the extra time spent on group activities.

### *Question 9: What were your previous perceptions of the Scholarship of Teaching and Learning prior to attending the HELTASA conference?*

'I did not perceive it to be scholarship,' 'I just thought of it as methods of research,' 'I thought it was a bursary given for study purposes' and 'I had no idea that such a concept existed.' These comments correlate well with previous research indicating that the concept of SoTL may mean a lot of different things to academic staff members (Maphosa and Wadesango 2014). However, attending HELTASA2014 exposed these academics to the spokes of the SoTL unicycle, with tangible benefits.

### *Question 10: How did you benefit from attending HELTASA2014?*

'Exposure to new ideas', 'Exposure to presenting our research', 'The portfolio of evidence workshop helped me to see the need to restructure my student reports' and 'I am not the only one with teaching problems.' These comments suggest that personal benefits were derived by the participants (knowledge acquisition and presentation skill development). However, benefits for student learning were also derived as one participant undertook to restructure current student reports to better reflect a portfolio of evidence.

### *Question 11: What new knowledge did you acquire at the HELTASA2014 conference?*

'Reading with understanding', 'High-impact practices', 'The flipped classroom' and 'Student accountability to learning' were made by the four participants. The awareness of this knowledge would never have materialised, had these academics never joined the SoTL programme. Informed decisions may now be made in their respective classrooms regarding the implementation of some of these pedagogies or philosophies.

### *Question 12: Which aspects of this new information do you hope to implement in your modules?*

'The flipped classroom' and 'The portfolio of evidence' were cited by the four participants, which related to the previous question. These participants have received valuable insights into how to implement or apply these pedagogies in their classrooms to the benefit of their students. Indeed, national conferences help to disseminate information about what works and what the challenges are (Zlotnik 2013).

## Discussions

The discussion of the results links each question with the different spokes of the SoTL unicycle. Some questions are directly linked to only one or two spokes, while other questions are indirectly linked to a number of spokes.

Question 1: The fourth response 'It was a way of getting assistance in writing articles' indicates that this staff member had become *aware* that personal involvement with the SoTL group would provide both the opportunity and support for him or her to publish their research. This awareness may have been created through either word of mouth or through the achievements of the principal research leader of the group who has been involved with SoTL for many years.

Question 2: Two academics responded 'It is time consuming to other colleagues,' which may be indirectly linked to four different spokes, namely *develop*, *apply*, *evaluate* and *share*. To develop a new action plan, apply it in the classroom, evaluate the results of the plan and then publish these results in a conference paper or journal article requires ongoing efforts over an extended period of time. However, these responses may also indicate that some academics are *aware* of the time

and effort required to engage with these spokes of the SoTL unicycle, thereby choosing not to get personally involved with an SoTL group due to their own time concerns.

Question 3: Two key responses regarding benefits of joining an SoTL programme ('share my research' and 'I have developed an action plan') may be directly linked to two spokes, namely *develop* and *share*, while two further spokes are indirectly involved, namely *apply* and *evaluate*. Sharing involves making known to others the processes (such as the development and application of a teaching activity) and outcomes (such as the evaluation of the results of a teaching activity).

Question 4: Two key responses, 'Opportunities to publish' and 'The possible improvement of their teaching practice' may be indirectly linked to two spokes, namely *share* and *crystallise*. Sharing processes and outcomes is often realised through a paper or journal publication, while the improvement of a teaching practice helps to reinforce or crystallise that which really helps to enhance the teaching and learning process. This is missed by academics who do not personally get involved with an SoTL group.

Question 5: Two academics responded 'Fitting the SoTL activities into my current routine', that may again be indirectly linked to four spokes, namely *develop*, *apply*, *evaluate* and *share*. These four spokes require the majority of time and effort within the SoTL unicycle, and would be a key challenge that would have to be addressed within an academic's routine.

Question 6: The response 'Lack of awareness' reinforces the *awareness* spoke of the SoTL unicycle, as many academics may refrain from getting personally involved in an SoTL group as they do not know what it really engenders. Creating awareness through workshops, Faculty Board Meetings and research reports (as suggested under Question 7) may attract more staff to an SoTL group. However, the response 'Anything that looks like extra work' suggests that some academics may be aware of the time and efforts required over an extended period of time to *develop*, *apply*, *evaluate* and *share* their teaching activities.

Question 7: Using annual reports and presenting the accomplishments of an SoTL group to Faculty members were two recommendations for creating awareness, which may also result in the crystallisation of specific teaching practices. This crystallisation appears as the achievements of the SoTL group are repeatedly emphasised and conveyed to others. The first and last spokes of the SoTL unicycle, namely *aware* and *crystallise*, are therefore encompassed in this question on how to raise awareness of what an SoTL group does.

Question 8: 'Time' and 'Resistance to change' are two key concerns identified by the participants, which again relate indirectly to four spokes of the SoTL unicycle, namely *develop*, *apply*, *evaluate* and *share* new teaching activities. The first spoke, namely *aware*, is also involved as some academics may not really know what an SoTL programme really engenders. Fear of the unknown is often associated with resistance to change.

Question 9: 'I just thought of it as methods of research' and 'I thought it was a bursary given for study purposes' were two academic responses that may be indirectly linked to *reflection* and *discernment*. These academics reflected on their own personal viewpoints of what SoTL engendered and then discerned their misconceptions, or knowledge gaps, which needed to be addressed.

Question 10: Responses included the words 'Exposure to new ideas', 'The portfolio of evidence workshop helped me' and 'I am not the only one with teaching problems.' These comments show that the academics that joined the SoTL group were made *aware* of new ideas (such as a portfolio of evidence) and facts (many academics have teaching problems), which ultimately benefitted them in their teaching practice.

Question 11: Two key benefits identified by the participants related to high-impact practices and the flipped classroom. Academics who attended this educational conference were made *aware* of a number of relevant teaching practices, and then used *discernment* to identify which practices they believe would be beneficial to their own students.

Question 12: Two key responses were again related to high-impact practices (this included the portfolio of evidence) and the flipped classroom. These academics again engaged with a number of spokes of the SoTL unicycle, including *reflect*, *discern*, *develop*, *apply*, *evaluate* and *share*. They

were helped to reflect on their own teaching practice, discerning how these new teaching practices were developed, applied, evaluated and shared by other researchers.

So in summary, the eight spokes of the SoTL unicycle may be linked to five categories of questions used in the interview relating to the following:

- The purpose of an SoTL group (Question 9) – related spokes include reflection and discernment.
- Reasons for personal involvement in an SoTL group (Questions 1, 2 and 6) – related spokes include aware, develop, apply, evaluate and share.
- The benefits enjoyed of joining an SoTL group (Questions 3, 4, 10–12) – related spokes include aware, reflect, discern, develop, apply, evaluate, share and crystallise.
- Challenges faced in belonging to an SoTL group (Questions 5 and 8) – related spokes include aware, develop, apply, evaluate and share.
- Recommendations (Question 7) – related spokes include awareness and crystallise.

## Conclusions

The purpose of this article was to highlight the perceptions of four academics from different engineering fields towards a programme relating to SoTL at a University of Technology. The SoTL unicycle was described that may be linked to five major categories of questions that may be posed to ascertain perceptions. These include the purpose of an SoTL group, reasons for personal involvement, benefits, challenges and recommendations. A focus group interview revealed that some of the participants thought that an SoTL programme was a bursary given to students for study purposes. Furthermore, three out of the four participants voluntarily joined an SoTL programme to improve their research and writing skills. Tangible benefits of doing so by these academics were listed as 'developing a teaching action plan' and 'belonging to a dynamic research group'. Participants in the SoTL programme benefitted from attending the HELTASA2014 conference in that they developed their presentation skills and acquired new pedagogies which they plan to implement into their teaching practice. Two key challenges which they encountered were coming to grips with the educational terminology and in making time for engaging with the eight different spokes of the SoTL unicycle. Recommendations for creating awareness of what SoTL really engenders were made that may go a far way in reducing reluctance to and resistance in joining SoTL programmes.

The SoTL unicycle illustrates five key aspects. First, academics new to SoTL must put forth much effort and persistent in coming to grips with what SoTL really engenders, just as one would need to invest much time and effort in successfully riding a unicycle. Second, academics familiar with SoTL must continue to pedal the unicycle by making use of ALL eight spokes, lest they stumble and fall from the SoTL path. Third, all academics must realise that they need to ride the unicycle themselves, scrutinising and improving on their own teaching practice. Fourth, academics familiar with SoTL must continue to maintain their balance (or time management) between their various academic responsibilities, just as one's balance on a unicycle is imperative to success. Fifth, and final, mastering the unicycle brings much satisfaction and pleasure, which academics will also reap from engaging fully in SoTL, as they strive to improve student learning.

Limitations of the study relate to the small sample size (only four participants who joined the ARGEE group in 2014) which reflects a limited research study. However, some of the findings are consistent with published literature, especially with regard to the barriers faced in promoting SoTL among faculty members. Other findings shed light on the tangible benefits and specific challenges experienced by engineering academics that joined an SoTL programme at a University of Technology in SA. The sample size could not be increased as the questions could only really be answered by the engineering academics that joined the SoTL programme (in this case only four joined from more than 100 staff members in the Faculty). However, it would be advantageous to interview staff members from other Faculties who joined similar SoTL programmes late in 2014, in order to improve the

reliability and validity of these results. A cross-sectional design may prove useful in this regard. Furthermore, interviewing academics who did not join the SoTL programme during the same period of time can result in a triangulation of the data. However, specific questions (Questions 10–12) relating to the educational conference (HELTASA2014) would have to be removed, as these non-participating academics would have received NO benefits or knowledge which they would be able to implement in their teaching practice!

The four engineering academics, that were the first to join the ARGEE group in June 2014, may indeed have wondered 'what the hell are we getting ourselves into' when the SoTL programme was introduced late in 2014. Attending the HELTASA2014 conference helped these academics to better understand SoTL in terms of improving their teaching practice and improving student learning. A key recommendation to all institutions of higher education is to encourage their academics (especially their less-experienced ones) to participate in and attend national educational conferences. This will lead to a larger community of practice, where all participating academics may share their reflections and action plans, thereby crystallizing what SoTL really engenders. Indeed, having academics with a good head, a good heart and a literate tongue will lead to the ultimate goal of SoTL being realised, that of improving student learning.



## Disclosure statement

No potential conflict of interest was reported by the authors.

## Notes on contributors

***Arthur James Swart*** is currently an Associate Professor at the Central University of Technology. His research interests include the use of educational technology to help fuse theory and practice for electrical engineering students. He has published more than 50 conference papers and articles in this regard.

***Nicolaas Luwes*** is currently a Senior Lecturer at the Central University of Technology. His research interests are focused on helping undergraduate students better understand automation.

***Lienie Olwagen*** was a Lecturer at the Central University of Technology. Her research interests were in helping Mechanical Engineering students adapt to laboratory work.

***Cameron Greyling*** is currently a Junior Lecturer at the Central University of Technology. Her research interests include the use of education technology to help merge theory and practice for built environment students (quantity surveying and construction management).

***Carel Korff*** is currently a Lecturer at the Central University of Technology. His research interests focus on the use of educational technology to help undergraduate students understand transportation engineering.

## References

Albers, Cheryl. 2008. "Improving Pedagogy Through Action Learning and Scholarship of Teaching and Learning." Review of *Teaching Sociology* 36 (1): 79–86.

Bass, Randy. 1999. "The Scholarship of Teaching: What's the Problem." Review of *Inventio: Creative Thinking About Learning and Teaching* 1 (1): 1–10.

Bernstein, Daniel. 2013. "How SoTL-active Faculty Members Can Be Cosmopolitan Assets to an Institution." Review of *Teaching and Learning Inquiry: The ISSOTL Journal* 1 (1): 35–40.

Bettin, Giulia, Andrea Filippo Presbitero and Nicola Spatafora. 2014. "Remittances and Vulnerability in Developing Countries." Review of *World Bank Policy Research Working Paper* (6812): 1–29.

Bishop-Clark, Cathy, and Beth Dietz-Uhler. 2012. *Engaging in the Scholarship of Teaching and Learning: A Guide to the Process, and How to Develop a Project from Start to Finish*. Sterling: Stylus Publishing, LLC.

Boyer, Ernest. L. 1990. "Scholarship Reconsidered: Priorities of the Professoriate." Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.

Brainy Quote. 2015. "Homepage." Accessed January 9, 2015. http://www.brainyquote.com/quotes/.

Central University of Technology. 2015. "Policy and Procedure on the Promotion of Academic Staff." In *Programme Policy*. Bloemfontein, Free State.

Cutting, James E. 2007. "Rhythms of Research." Review of *Psychological Science* 18 (12): 1023–1026.

Dewar, Jacqueline, and Marilyn Cohn. 2010. "A Synthesis of the Challenges Facing SoTL at Carnegie Affiliate Institutions." Review of *Synthesis* 4 (1): 1–14.
Edwards, Linda H. 2010. "A Writing Life." Review of *Mercer Law Review* 61: 867–898.
Engin, Marion. 2014. "Observing Teaching: A Lens for Self-reflection." Review of *Journal of Perspectives in Applied Academic Practice* 2 (2): 2–9.
Fassio, Omar, Chiara Rollero, and Norma De Piccoli. 2013. "Health, Quality of Life and Population Density: A Preliminary Study on "Contextualized" Quality of Life." Review of *Social Indicators Research* 110 (2): 479–488.
Glenn, A. 2014. "Promoting Social Change Through Service-Learning in the Curriculum." Review of *Journal of Effective Teaching* 14 (1): 51–62.
Greenbaum, T. 1993. *The Handbook for Focus Group Research*. Revised ed. Lexington, MA: Lexington Books.
Gurung, Regan AR, and Janie H. Wilson. 2013. "Advancing Scholarly Research on Teaching and Learning." Review of *New Directions for Teaching and Learning* 2013 (136): 1–6.
Halter, Anthony P. 2015. "Welfare Reform: One State Alternative." Review of *The Journal of Sociology & Social Welfare* 16 (2): 151–161.
Hermans, CAM, and E. Koerts. 2013. "Towards a Model of Influence of Spirituality on Leadership: Empirical Research of School Leaders on Catholic Schools in the Netherlands." Review of *Journal of Beliefs & Values* 34 (2): 204–219.
Holgate, Peter, and Rachel Sara. 2014. "Towards a Learning Commons for Architecture." Review of *Charrette* 1 (1): 146–155.
Hutchings, Pat, Mary Taylor Huber, and Anthony Ciccone. 2011. *The Scholarship of Teaching and Learning Reconsidered: Institutional Integration and Impact*. Vol. 21. San Francisco, CA: John Wiley & Sons.
Illinois State University. 2015. "The Scholarship of Teaching and Learning." http://sotl.illinoisstate.edu/about/.
Jaffri, Hadijah, Narina Abu Samah, and Lokman Mohd Tahir. 2014. "Scholarship of Teaching and Learning: How Does It Perceive by Engineering Lecturers?" Paper presented at the 2014 international conference on Teaching and Learning in Computing and Engineering (LaTiCE).
Kivitalo, Mari, Kaisu Kumpulainen, and Katriina Soini. 2016. "Exploring Culture and Sustainability in Rural Finland." In *Cultural Sustainability and Regional Development : Theories and Practices of Territorialisation*, edited by J. Dessein, E. Battaglini, and L. Horlings, 94–107. Abingdon: Routledge.
Kivits, J., M-L. Erpelding, and F. Guillemin. 2013. "Social Determinants of Health-Related Quality of Life." Review of *Revue d'épidémiologie et de santé publique* 61: S189–S194.
Lanning, Sharon K, Michelle McGregor, Geralyn Crain, Christopher J. Van Ness, Nancy T. Keselyak, and John W. Killip. 2014. "The Status of the Scholarship of Teaching and Learning in Dental Education." Review of *Journal of Dental Education* 78 (10): 1353–1363.
Li, Qi. 2014. "Beyond Summative Evaluation: Improving the Quality of Teaching and Learning in China's Higher Education." In *Survival of the Fittest*, edited by Q. Li and C. Gerstl-Pepin, 57–72. Berlin: Springer.
Liamputtong, P. 2011. *Focus Group Methodology: Principle and Practice*. London: SAGE.
Maes, Jeanne D. 2014. "Does Partnering Still Work? Reflecting On 25 Years in The Trenches." Review of *Organization Development Journal* 76: 75–83.
Makai, Alexandra, Viktória Prémusz, Kata Füge, Mária Figler, and Kinga Lampek. 2015. "Social Participation and Health Among Ageing People in East-Central Europe." Review of *Practice and Theory in Systems of Education* 10 (2): 177–185.
Maphosa, Cosmas, and Newman Wadesango. 2014. "Interrogating the Role of Academic Developers in the Promotion of Scholarly Teaching and the Scholarship of Learning and Teaching." Review of *International Journal of Educational Sciences* 6 (1): 75–83.
Marcketti, Sara, Ann Marie VanDerZanden, and Jennifer R. Leptien. 2015. "SoTL Champions: Leveraging Their Lessons Learned." Review of *International Journal for the Scholarship of Teaching and Learning* 9 (1): 1–23.
Mathison, Karin. 2015. "Effects of the Performance Management Context on Australian Academics' Engagement with the Scholarship of Teaching and Learning: A Pilot Study." Review of *The Australian Educational Researcher* 42 (1): 97–116.
McKinney, Kathleen. 2007. *Enhancing Learning Through the Scholarship of Teaching and Learning: The Challenges and Joys of Juggling*. Vol. 139: Bolton: Anker Publishing Company.
McKinney, Kathleen, and Pat Jarvis. 2009. "Beyond Lines on the CV: Faculty Applications of Their Scholarship of Teaching and Learning Research." Review of *International Journal for the Scholarship of Teaching and Learning* 3 (1): 1–13.
Mincer, Andi Beth, and Sabrina Hessinger. 2012. "Campus-wide Assessment of SoTL: Analysis of Perceptions, Engagement and Obstacles." In SoTL Commons Conference, Georgia Southern University, Statesboro, March 7–9.
Oxford Dictionary. 2013. Accessed 21 October. http://www.oxforddictionaries.com/.
Peltz, President Jeff. 2015. *Speech and Theatre Association of Missouri*. Warrensburg: University of Central Missouri.
Price, Linda, and Adrian Kirkwood. 2014. "Using Technology for Teaching and Learning in Higher Education: A Critical Review of the Role of Evidence in Informing Practice." Review of *Higher Education Research & Development* 33 (3): 549–564.
Prosser, M., and K. Trigwell. 1999. *Understanding Learning and Teaching: The Experience in Higher Education*. Milton Keynes: Open University Press.
Quinnell, Rosanne, Carol Russell, Rachel Thompson, Nancy Marshall, and Jill Cowley. 2010. "Evidence-Based Narratives to Reconcile Teaching Practices in Academic Disciplines with the Scholarship of Teaching and Learning." Review of *Journal of the Scholarship of Teaching and Learning* 10 (3): 20–30.

Rubin, A., and E. Babbie. 2013. *Brooks/Cole Empowerment Series: Essential Research Methods for Social Work*. Belmont: Cengage Learning.

Secret, Mary, Monica Leisey, Sharon Lanning, Susan Polich, and Joseph Schaub. 2012. "Faculty Perceptions of the Scholarship of Teaching and Learning: Definition, Activity Level and Merit Considerations at One University." Review of *Journal of the Scholarship of Teaching and Learning* 11 (3): 1–20.

Sheau Ting, Low, Abdul Hakim Bin Mohammed, and Weng Wai Choong. 2012. "Proposed Implementation Strategies for Energy Sustainability on a Malaysian University Campus." Review of *Business Strategy Series* 13 (5): 208–214.

Silva-Martinez, Jackelynne. 2015. "Application of Crew Resource Management Techniques in the Aerospace Industry." Paper presented at the Aerospace Conference, 2015 IEEE.

Sjoer, Ellen, and Sofia Dopper. 2006. "Learning Objects and Learning Content Management Systems in Engineering Education: Implications of New Trends." Review of *European Journal of Engineering Education* 31 (4): 363–372.

Swart, James, Lienie Olwagen, Cameron Britz, and Nicolaas Luwes. 2014. "Reflecting on the Balance Between the Practical and Theoretical Success of African Engineering Students – A Case Study from the Central University of Technology." In *HELTASA 2014*, 1–2. Bloemfontein: University of the Free State.

Tinnemann, Peter, Theresa ES. Bauer, Jenny De la Torre Castro, Silvia Binting, and Thomas Keil. 2013. "Street Health: Cross-sectional Study Identifying Social Medicine Issues Amongst Patients of the Health Center for Homeless in Berlin, Germany." Review of *Social Medicine* 8 (1): 23–31.

Trigwell, Keith, Elaine Martin, Joan Benjamin, and Michael Prosser. 2000. "Scholarship of Teaching: A Model." Review of *Higher Education Research and Development* 19 (2): 155–168.

Wankat, Phillip C., Richard M. Felder, Karl A. Smith, and Frank S. Oreovicz. 2002. "The Scholarship of Teaching and Learning in Engineering." Review of *Disciplinary Styles in the Scholarship of Teaching and Learning: Exploring Common Ground*: 217–237.

Wholey, J. S., H. P. Hatry, and K. E. Newcomer. 2010. *Handbook of Practical Program Evaluation*. New York: Wiley.

Yılmaz, Derya, and Gökhan Kılıçoğlu. 2013. "Resistance to Change and Ways of Reducing Resistance in Educational Organizations." Review of *European Journal of Research on Education* 1 (1): 14–21.

Zamfirescu, Constantin-Bala, and Ciprian Candea. 2011. "Planning in Collaborative Stigmergic Workspaces." In *Computational Collective Intelligence, Technologies and Applications*, edited by Jędrzejowicz Piotr, Nguyen Ngoc Thanh, and Hoang Kiem, 160–169. Berlin: Springer.

Zlotnik, Joan Levy. 2013. "University-Agency Partnerships to Advance Child Welfare – The Children's Bureau." In *The Children's Bureau: Shaping a Century of Child Welfare Practices, Programs and Policies*, edited by M. McCarthy, N. Dickinson, and K. Briar-Lawson, 275–292. Washington, DC: NASW Press.