

# THE USE OF ACTIVE LEARNING IN A PRIVATE HIGHER EDUCATION INSTITUTION: THE LECTURER'S PERSPECTIVE

**M. Beyleveld\***

e-mail: mia.beyleveld@gmail.com

**J. J. R. de Villiers\***

e-mail: rian.devilliers@up.ac.za

**W. J. Fraser\***

e-mail: william.fraser@up.ac.za

\*Department of Science, Mathematics and Technology Education  
University of Pretoria  
Pretoria, South Africa

## ABSTRACT

Lecturers could potentially have different reasons why they would choose a specific teaching strategy including government policy, education institution policy or management directive. Despite these factors lecturers could also choose to use Active learning strategies out of their own accord and not because they are being told so. This qualitative interpretive case study sets out to understand the views of 11 lecturers teaching in three different faculties: Faculty of Commerce and Law, Faculty of Social Science and Faculty of Applied Science, in a private higher education institute in South Africa on their motivation in using Active learning strategies in their classrooms. The findings suggest that lecturers are using Active learning due to them believing that: Active learning prepares students for the workplace by developing the required skills; supports learning in the classroom; changes boring passive learning classes into to engaging enjoyable active classes in which students want to participate; and their own experience as a student having had a lecturer that used Active learning strategies in their classes that worked for them.

**Keywords:** active learning, case study, government policy, motivation, private higher education

## INTRODUCTION

Different countries each have their own governing body that regulates the quality of higher education. In South Africa, the Department of Education (DOE) in conjunction with the South African Qualifications Authority (SAQA) mandates lecturers at higher education level to deliver students that should be able to: “Problem-solve in respect of which a student is able to demonstrate the ability to identify, analyse, evaluate, critically reflect on and address complex

problems, applying evidence-based solutions and theory-driven arguments” by the end of their undergraduate journey (SAQA 2012, Level descriptor d, 10). Except for the clear direction on the standards as described in the level descriptors and the outcome-based curriculum design, there are however no guidelines provided by the South African government policy on which teaching and learning strategy(ies) could be used to enable lecturers to deliver on this mandate and it is often left to the discretion of each higher education institution whether public or private when applying the strategy in practice. One of the teaching methodologies to consider is Active learning, and literature shows widespread evidence of its use particularly in higher education, to develop better quality students. But do lecturers use Active learning because they are being told or would there be other underlying reasons? In the next few sections, Active learning as a teaching methodology and the current perceptions of lecturers in higher education will be discussed.

### **ACTIVE LEARNING AS AN APPROACH TOWARDS LEARNING**

One of the teaching strategies used frequently more in higher education today is Active learning. When considering Active Learning, it can be defined as “individuals who seek to understand how they learn and are usually self-motivated or self-directed in learning” (Roth 1996, 4). The opposite of Active learning would be Passive learning. The passive student is dependent on a lecturer to impart or transfer what is to be learned. Passive learning requires little student personal involvement and students do not self-reinforce. Passive learning tends to get lifeless very quickly as these students soon tend to become disinterested, non-motivated and non-responsive, and ineffective in their learning. That which is learned passively is typically not well retained and is commonly not effectively or enthusiastically applied (Petress 2008, 1).

The use of Active learning in higher education is further supported by various studies done across multi-disciplines including social sciences, marketing, engineering and science showing the effective use of Active learning methodologies in the classroom (Diamond, Koernig and Iqbal 2008; Favero 2011; Kyounga et al. 2013; Loji 2012; Olivares, Saiz and Rivas 2013; Snyder and Snyder 2008). Active learning is characterised by students doing more than just listen. They should also not only be involved but should be thinking about what they are doing (Bonwell and Eison 1991). It also encourages students to take responsibility for what they learn (Kane 2004), thus moving them from passive to active learners. Active learning requiring higher levels of self-discipline and self-direction (Alderman and MacDonald 2015). It is this self-direction that facilitates a deeper learning that allows a student to critically analyse new ideas, linking it to already known principles and concepts using this to solve problems in a new unfamiliar context (Sims 2006). Thus, students engaging in Active learning methodologies

especially where students need to participate and think about what they are doing can facilitate critical thinking and problem solving as reported by Tomey (2003), Gupta et al. (2015), Olivares, Saiz and Rivas (2013), Oliver (2007) and White et al. (2016)

## **PERCEPTIONS OF LECTURERS OF ACTIVE LEARNING IN HIGHER EDUCATION**

The use of Active learning as a teaching strategy in higher education has afforded many more studies particularly considering the perceptions of students and lecturers when it comes to using it. Students value participating in learning activities that enhance their learning (Lumpkin, Achen and Dodd 2015) and aid their understanding (Detlor et al. 2012). The barriers to Active learning from lecturers' point of view has been described by Michael (2010) which include three categories: student characteristics or attributes, pedagogical issues that affect student learning and lecturer characteristics or problems directly affecting lecturers. Active learning is preferentially used by subject specialist lecturers with educational specialties (Addy et al. 2015) which shows that training of lecturers does play a role in the effective use of Active learning strategies. Studies have also shown how lecturers or teachers perceived and acted upon government policy with regards to reforming current traditional classroom teaching practice to that which include Active learning strategies in both Ethiopia, Bangladesh, Qatar and China (Casale 2010; Chowdhury 2016; Qureshi et al. 2016; Riley 2013 ).

The reasons however on why lecturers use Active learning approaches out of their own accord is not clear. In this case study, the institution in question does have a teaching and learning policy that advises lecturers to engage students and facilitate learning, so one would think that lectures would use this policy as the reason for using Active learning strategies. However, early in the study, it was seen that this had not been the case. Furthermore, as mentioned before there are barriers in using Active learning strategies which would potentially discourage its use. Thus, this study set out to understand why lecturers out of their own accord use Active learning methodologies in their classes.

## **METHODOLOGY**

### **Participants and Instruments**

An interpretivist approach using a qualitative narrative case study strategy was used in this study due to the aim of trying to understand the participant's view on Active learning as a teaching strategy in a private higher education institution. The narrative design enabled the researcher to write the story of each participant that provided in-depth knowledge and

background to answers provided, which otherwise would have gone missing. The private higher education institution consists of 12 campuses across South Africa. Sampling only took place on one of the 12 campuses considered to be the main campus. Eleven participants were purposefully selected using pre-screening questionnaires based on their professed teaching philosophy and strategy used in the class together with their experience in teaching that way. Participants were categorised as being using Active learning strategies for less than three years or more than three years by review of their professed teaching philosophy and strategy (Did their answers reflect Active learning i.e. student centred?) and their own time frame given of applying it in practice. Full-time participants from each of the three faculties on campus were selected based on these criteria to ensure a valid representation and continuity. After participants indicated their interest to participate in this study they had semi-structured interviews for at least one hour at a time. The biographical data of the participants is summarised in Table 1. Pseudonyms were used throughout the study.

**Table 1:** Participants’ biographical data.

<b>Participants (Pseudonyms)</b>	<b>Gender</b>	<b>Age</b>	<b>Years’ experience in using Active learning</b>	<b>Faculties</b>
Melissa	Female	33	Less than 3	Commerce and Law
Heleen	Female	35	More than 3	
Chrizzelle	Female	26	Less than 3	
Lucy	Female	45	More than 3	
David	Male	46	Less than 3	Social Science
Bo	Female	34	More than 3	
Anne	Female	34	More than 3	
George	Male	27	Less than 3	Applied Science
Daren	Male	32	More than 3	
Lisa	Female	26	Less than 3	
Hope	Female	39	More than 3	

**Procedure and analysis**

Ethics clearance as well as permission was obtained from Dean’s in question in which the scope of the study was explained to lecturers. Lecturers voluntarily completed the pre-screening questionnaires which then was used to purposefully select participants for this study. Consent forms were signed and a background questionnaire was used to try and limit the time spent during the interviews to information pertaining to the research questions posed. Interviews were transcribed and checked by participants after which Atlas Ti version 7 was used to perform a thematic analysis using structural, descriptive and in vivo coding strategies.

## FINDINGS

During the interviews, participants were asked to explain why they were using Active learning in their classrooms. Seven themes were identified from the interview data as shown in Table 2.

**Table 2:** Code frequency table summarising themes developed to understand lecturer motivation

Codes identified	Own experience as student	Students' preparedness for the workplace	Skill development	Students enjoy classes	Students engagement during class	Supports learning of students
Frequency of codes	11	30	46	15	8	52
# Participants	4	9	10	6	5	10

### Students develop skills, prepared for the workplace

According to ten of the eleven participants' they believe that students develop skills that they otherwise would not have acquired through traditional teaching. The skills mentioned by participants include development of teamwork, self-confidence, emotional intelligence, effective communication problem-solving and critical thinking.

One of the participants, Lisa explained which skills she believes are advanced through the use of Active learning:

“Teamwork is definitely one of them. Emotional intelligence is another one, understanding how to work with people, how to understand what people are telling you. Writing skills, communication skills, so a lot of soft skills that you don't think are necessary.”

In a longitudinal study that explored the career pathways taken by undergraduates and their success in it, reference is made to some of the same skills listed by Lisa. The skills identified as most useful were team working, self-motivation, subject knowledge, personal organization, oral and written communication. The study also revealed areas recommended for further curriculum development, including information technology, subject-specific practical skills and additional support with careers advice and guidance (Shah, Pell and Brooke 2004).

Another participant, Melissa contributed as follow concerning the skills developed when using Active learning:

“Problem-solving skills. Analysis skills. What is actually causing the problem? Being able to synthesise information in your head and put it into practical terms so you have to have the theory. I mean there are reasons why we have the theory but you have to be able to put that over into market-related words and market-related plans and strategies.”

From this study, it appears that lecturers believe that their Active learning strategies develop skills in students, the same skills that one would expect to be required in the workplace. Four participants believed that using Active learning in the class room stimulate the ability of students to apply knowledge to solve problems.

“The way in which you approach a problem, a practical market problem, differs when you are exposed to an active learning teaching style because you know what to do with a problem. You get a problem and you have different ways of solving that problem whereas if you have a lecture-based class it is just theory and examples.”

According to Carnevale and Smith (2013) employers need skills which include reasoning, communicating, learning, general problem-solving and behavioural skills. The 21<sup>st</sup>-century skills support these skill requirements. This was developed to define and illustrate the skills and knowledge students would need to succeed in work, life, and citizenship (Trilling and Fadel 2009). In particular, when it comes to the skills required for life and career, the following skills are mentioned by the partnership: Flexibility and adaptability, social and cross-cultural skills, productivity and accountability, initiative and self-direction, leadership and responsibility. Students should be able to apply knowledge obtained during their studies when they enter employment, but this also requires the necessary skill development. According to Peters and Beeson (2010), the gap between skills need by employers and skills developed by education institutions can be reduced by using Active learning strategies in the classroom. This has been supported by the findings from Ito and Kawazoe (2015) that showed how Japanese industry skill requirements such as the ability of students to discover was enhanced by Active learning strategies. These requirements may even continue to contribute to what now is known as the fourth industrial revolution. Jobs present now may be absent and students will need to adapt to a fast paced, continual engagement with the “new” especially linked to the world of artificial intelligence. But it remains clear according to Butler-Adam (2018) that even then students would be expected to problem-solve, be adaptable, be able to express themselves in both written and spoken word and make ethical and moral decisions. Most of which could still be addressed by Active learning.

Some of the participants referred to Active learning strategies making students more confident. Participants explained that they observed that students are simply better equipped also to cope with work stress and workload. Not strange that two participants also referred to students being more independent, another two referring to students becoming innovative and creative. The participants in this study could explain what the workplace requires and why they need Active learning as a teaching and learning strategy to get students prepared.

## Supports learning of students

Almost all participants (10) also contributed data that reinforces the role of Active learning in supporting student learning. Various reasons were provided on how lecturers saw this support including that it stimulates deep learning, it enables students to understand concepts better, encourages class attendance, stimulates student self-regulation and enables students to be better prepared for the learning process.

Six participants thought Active learning to promote deep learning. Students need time to reflect on what they have discovered and learnt, they have to move information acquired from the short-term memory or working memory, where it only stays for a few minutes, to the long-term memory where it will remain for longer periods of time. The transfer requires attention, organisation, and repetition (Cooperstein and Kocevar-Weidinger 2004). This is considered as deep learning (Biggs 1987; Entwisle 1981; Sims 2006). According to Diamond, Koernig, and Iqbal (2008), it is this deep learning facilitated by Active learning that nurtures the development of problem-solving skills in students (Diamond, Koernig and Iqbal 2008; Yew et al. 2016). According to DeLotell, Millam, and Reinhardt (2010) students that show interest, understanding, and application (all characteristics of deep learning) in a subject facilitates retention rates.

This concept has furthermore been reinforced by a study that implemented Active learning strategies such as group learning in an introductory undergraduate class. The study showed deep learning in students across topics. The nature of the group learning strategy allowed students to develop the ability to have discourse on a particular topic, which enabled them to score significantly higher in more demanding open-ended questions all of which according to the authors could be contributed to sufficient deep learning that took place during these Active learning (Tsaushu et al. 2012).

Five participants explained that they believed Active learning helped students to understand concepts. One of the participants explained how she observed that students were understanding concepts better because of Active learning in her classes:

“So it is more actively participating and I think when they do that the more they read, the more they research, the more examples they are exposed to, the more examples they discuss with their friends. Suddenly there the light goes on, ah ha okay now I understand it.”

Likewise, another participant added how these Active learning strategies can facilitate deep learning: “They will go and read a little bit deeper than what if the lecturer just stands there and explains”.

Four participants referred to Active learning encouraging better class attendance. Another participant Lisa ventured to try and explain why she had more students attending her classes that incorporated Active learning components:

“A number of students who were absent for previous classes (in which I lecture and ask a number of spot questions) were now present in these classes. These students have a different learning style most likely- and prefer the relaxed environment created by this activity, and the opportunity to learn in this manner.”

These findings are supported by Revell and Wainwright (2009, 1) whose study are based on lecturer and student perceptions highlighting the following three factors that make lectures attended by students indispensable: “(i) a passionate, enthusiastic lecturer, who can bring a subject to life for students, (ii) a high degree of participation and interactivity, and (iii) a clear structure which enables integrative links to be made more easily.”

Four participants revealed how they believed Active learning promoted self-regulated learning in their students. Participants shared how they believed that using Active learning made students independent and thus more successful in their studies. Lisa highlights this idea of students being self-directed or self-regulated:

“Where you’re forcing a student to be independent of you and to figure out a problem just with some guidance but not with answers. If you give someone an answer all they will know is the answer. It’s like giving someone a fish, all they will know is I’ve got a fish, I can eat it now. What happens tomorrow? How am I going to get my fish tomorrow?”

Active learning encourages students to take responsibility for what they learn (Kane 2004). Assignments that enhance the self-efficacy and motivation of students play a significant role in establishing effective self-regulation (Schunk 1996). This is furthermore underlined by Alderman and MacDonald (2015) that found that when students participate in Active learning it requires higher levels of self-discipline and self-direction on the student’s behalf. It may be that students need to put in more effort as they participate in the learning process as the learning is now more dependent on them participating rather than on the lecturer spoon-feeding the knowledge. It is especially this self-direction and self-discipline that is supported by some of the participants.

Heleen was also the only participant that explained that she believed that Active learning prepared her students better for the learning process enhancing their academic performance. In conversation with Heleen, it was revealed that when she facilitates Active learning, she requires

her students to do research before class and complete quizzes on the learning management system. This makes them better prepared for the class, which enriches the learning environment. Students are now more willing to participate as they have already acquired some knowledge related to the topic taught.

“This year I could see the pass rate was much better than the previous year.”

Another participant added that:

“I was surprised with the type of questions they asked and the examples they were referring to.”

This idea of having students prepare for class by doing learning activities on-line outside of class time has been given the name of the flipped classroom (Bergmann and Sams 2012). In one the study student performance in the exam significantly improved with 12 per cent by using the flipped format course (Gross et al. 2015). Furthermore, Tune, Sturek and Basile (2013) showed that by expecting their students to watch pre-recorded lectures at home and complete worksheets during class that contributed to their year mark allowed their students to perform better in those sections in the exam. It is however important to reflect on the findings of Clark (2015) showing that the flipped classroom model increased communication and engagement in class, even improved the quality of instruction but led to no significant changes in terms of academic performance. This begs consideration on the facilitator’s part in designing these learning opportunities.

### **Students enjoy and become engaged in the class**

Six participants referred to their observation of students enjoying their classes as motivation to use Active learning strategies. It has been shown how Active learning strategies have been used to improve the public face of the sociology discipline (Killian and Bastas 2015) by motivating students to want to continue with the next year of study. Five participants referred to Active learning engaging students in the classroom. Participant Lisa elaborated on this by saying:

“I’ve also noticed that students are more engaged. Usually when I give a lecture about more or less the same content they are sighing the last 20 minutes of the lecture and you can see it’s sighing and it’s de-motivating and it hurts but with this, last week Thursday when we had the session they were there up until the last minute, I had to tell the class, guys we’re done now, you may go.”

According to Weasel and Finkel (2016) Active learning strategies allow students to become more engaged in the classroom allowing their own personal learning to excel. The use of discussion groups and study or tutorial periods instead of lecture-based classes had a positive

impact on the motivation of students in a Biochemistry course. It became more important for these students to learn than to simply obtain high grades (Cicuto and Torres 2016). For on-line students, participation in the form of reading posts, the number of direct posts made and the number of meaningful “in-depth” statements could be correlated with a better course grade (Wilson, Pollock and Hamann 2007). This suggests that student participation or engagement could be an additional factor enhancing student performance.

### **Own experience as student**

The impact of the experience these lecturers had as students are also evident in that four participants referred to their own experience where they were influenced by a lecturer to teach the way they do. It was simply by having to participate in Active learning strategies themselves as students that showed them possible impact. It was them having to take charge of their own learning that made the difference. Anne explains this: “This seems the most natural way to lecture as it is the way I personally learn.”

Heleen shared about she saw in her undergraduate lecturer that made her feel that using Active learning would be beneficial for student learning:

“... her approach was totally different. She got you involved right from the start. You know she was interested in what did you have to say. What is your opinion? You have to go and do research and give feedback on that and I enjoyed that because I learned more from that. It was more valuable for me and I do believe definitely 100 percent that is why I am doing it today in my class”.

Dolan et al. (2014) describe the role of past experiences for lecturers as students focusing on those that had negative experiences such as having lecturers that used textbook-based teaching and rote learning, it prompted them to consider practices that promoted deep learning. This happened as they were exposed to that which did not work for them. It is however made clear that students’ well-being were significantly impacted by positive learning experiences or positive lecturer experiences.

### **CONCLUSION**

According to this study lecturers out of their own accord use Active learning in their classes because they believe it prepares students for the workplace by developing the required skills, enhancing students to learn better and creating a more engaging enjoying learning environment. Lecturers also use Active learning because they were inspired as students by their own lecturers. None of the lecturers who participated in this study referred to the institution policy or

management directive being the reason of why they used Active learning strategies. This seems to show that even though using Active learning strategies has its challenges (Michael 2010) lecturers opt to use it as they believe in it. Even though the limitations of this study include the results not being able to be generalised, it does show that in this specific context lecturers out of their own accord use Active Learning despite the institutions seemingly intention of support. This study would also benefit from having lecturers from more than one campus (the other eleven) participate to understand the dynamic of Active learning use with regards to their context too. The next question however would be to understand this motivation out of own accord. One would think that if a lecturer is using Active learning not because they are being told to do so, that they should have compelling evidence showing how their strategy contributes to these reasons identified from this particular study. Another train of thought would want you to understand what the institution in question could do to shift their current “appearing to be” non-relevant teaching and learning policy to that which contributes meaningful to the direction lecturers would take to ensure the overall enhancement of academic performance in all students concerned.

## REFERENCES

- Addy, T., P. Simmons, G. Gardner and J. Albert. 2015. A new “class” of undergraduate professors: Examining teaching beliefs and practices of science faculty with education specialties. *Journal of College Science Teaching* 44(3): 91–99.
- Alderman, M. K. and S. MacDonald. 2015. A self-regulatory approach to classroom management: Empowering students and teachers. *Kappa Delta Pi Record* 51(2): 52–56.
- Bergmann, J. and A. Sams. 2012. *Flip your classroom: Reach every student in every class everyday*. Washington: International Society for Technology in Education.
- Biggs, J. 1987. *Student approaches to learning and studying*. Edited by Radford house. Hawthorn: Australian council for educational research.
- Bonwell, C. C. and J. A. Eison. 1991. *Active learning: Creating excitement in the classroom*. 1991 ASHE-ERIC Higher Education Reports. Association for the Study of Higher Education. Washington D. C.: Eric Clearinghouse on Higher Education.
- Butler-Adam, J. 2018. The Fourth Industrial Revolution and education. *South African Journal of Science* 114(5/6): 1.
- Carnevale, A. and N. Smith. 2013. Workplace basics: The skills employees need and employers want. *Human Resource Development International* 16(5): 491–501.
- Casale, F. 2010. Adapting active learning in Ethiopia. UMI Dissertation publishing.
- Chowdhury, F. 2016. Employment of active learning at HEIs in Bangladesh to improve education quality. *International Education Studies* 9(10): 47–57.
- Cicuto, C. A. T. and B. B. Torres. 2016. Implementing an active learning environment to influence students’ motivation in biochemistry. *Journal of Chemical Education* 93(6): 1020–1026.
- Clark, K. R. 2015. The effects of the flipped model of instruction on student engagement and performance in the secondary mathematics classroom. *Journal of Educators Online* 12(1): 91–115.

- Cooperstein, S. E. and E. Kocevar-Weidinger. 2004. Beyond active learning: A constructivist approach to learning. *Reference Services Review* 32(2): 141–148.
- DeLotell, P. J., L. A. Millam and M. M. Reinhardt. 2010. The use of deep learning strategies in online business courses to impact student retention. *American Journal of Business Education* 3(12): 49–56.
- Detlor, B., L. Booker, A. Serenko and H. Julien. 2012. Student perceptions of information literacy instruction: The importance of active learning. *Education for Information* 29(2): 147–161.
- Diamond, N., S. Koernig and Z. Iqbal. 2008. Uniting active and deep learning to teach problem-solving skills: Strategic tools and the learning spiral. *Journal of Marketing Education* 30(2): 116–129.
- Dolan, A. M., F. Waldron, S. Pike and R. Greenwood. 2014. Student teachers' reflections on prior experiences of learning geography. *International Research in Geographical and Environmental Education* 23(4): 314–330.
- Entwisle, N. 1981. *Styles of learning and teaching*. New York: Wiley & Sons.
- Favero, T. 2011. Active review sessions can advance student learning. *Advances in Physiology Education* 35(3): 247–248.
- Gross, D., E. S. Pietri, G. Anderson, K. Moyano-Camihort and M. J. Graham. 2015. Increased preclass preparation underlies student outcome improvement in the flipped classroom. *CBE – Life Sciences Education* 14(4): 1–8.
- Gupta, T., K. Burke, A. Mehta and T. J. Greenbowe. 2015. Impact of guided-inquiry-based instruction with a writing and reflection emphasis on chemistry students' critical thinking abilities. *Journal of Chemical Education* 92(1): 32–38.
- Ito, H. and N. Kawazoe. 2015. Active learning for creating innovators: Employability skills beyond industrial needs. *International Journal of Higher Education* 4(2): 81–91.
- Kane, L. 2004. Educators, learners and active learning methodologies. *International Journal of Lifelong Education* 23(3): 275–286.
- Killian, M. and H. Bastas. 2015. The effects of an active learning strategy on students' attitudes and students' performances in introductory sociology classes. *Journal of the Scholarship of Teaching and Learning* 15(3): 53–67.
- Kyounga, K., S. Priya, S. Land and K. Furlong. 2013. Effects of active learning on enhancing student critical thinking in an undergraduate general science course. *Innovative Higher Education* 38(3): 223–235.
- Loji, K. 2012. Toward teaching methods that develop learning and enhance problem solving skills in engineering students. *South African Journal of Higher Education* 26(1): 120–135.
- Lumpkin, A., R. M. Achen and R. K. Dodd. 2015. Student perceptions of active learning. *College Student Journal* 49(1): 121–133.
- Michael, J. 2010. Faculty perceptions about barriers to active learning. *College Teaching* 55(2): 42–47.
- Olivares, S., C. Saiz and F. Rivas. 2013. Encouragement for thinking critically. *Electronic Journal of Research in Educational Psychology* 11(2): 367–394.
- Oliver, R. 2007. Exploring an inquiry-based learning approach with first-year students in a large undergraduate class. *Innovations in Education and Teaching International* 44(1): 3–15.
- Peters, R. and M. Beeson. 2010. Reducing the gap between skills sought by employers and developed by education. *Political Science and Politics* 43(4): 773–777.
- Petress, K. 2008. What is meant by “active learning”? *Education* 128(4): 566–570.
- Qureshi, S., K. Bradley, V. R. Vishnumolakala, D. F. Treagust, D. C. Southam, M. Mocerino and J. Ojeil. 2016. Educational Reforms and Implementation of Student-Centered Active Learning in Science at Secondary and University Levels in Qatar. *Science Education International* 27(3): 437–456.
- Revell, A. and E. Wainwright. 2009. What makes lectures “unmissable”? Insights into teaching

- excellence and active learning. *Journal of Geography in Higher Education* 33(2): 209–223.
- Riley, P. E. 2013. Curriculum reform in rural China: An exploratory case study. *Research and Issues in Music Education* 11(1): 1–12.
- Roth, G. L. 1996. Learning to learn: Western perspectives. International Adult and Continuing Education Conference, Washinton.
- SAQA. 2012. Level descriptors for the South African National Qualifications Framework.
- Schunk, D. H. 1996. “Attributions and the development of self-regulatory competence.” Annual Conference of the American Educational Research Association, New York.
- Shah, A., K. Pell and P. Brooke. 2004. Beyond first destinations. Graduate employability survey. *Active Learning in Higher Education the Journal of the Institute for Learning and Teaching* 5(1): 9–26.
- Sims, E. 2006. *A new shape for schooling? Deep learning – 1*. Edited by P. Chambers, *A new shape for schooling? Specialist schools and academies trust*.
- Snyder, L. and M. Snyder. 2008. Teaching critical thinking and problem solving skills. *Delta Pi Epsilon Journal* 50(2): 90–99.
- Tomey, A. M. 2003. Learning with cases. *Journal of Continuing Education in Nursing* 34(1): 34–38.
- Trilling, B. and C. Fadel. 2009. *21st century skills: Learning for life in our times*. San Francisco: Jossey-Bass.
- Tsaushu, M., T. Tal, O. Sagy, Y. Kali, S. Gepstein and D. Zilberstein. 2012. Peer learning and support of technology in an undergraduate biology course to enhance deep learning. *CBE – Life Sciences Education* 11(4): 402–412.
- Tune, J. D., M. Sturek and D. P. Basile. 2013. Flipped classroom model improves graduate student performance in cardiovascular, respiratory, and renal physiology. *Advances in Physiology Education* 37(4): 316–320.
- Weasel, L. H. and L. Finkel. 2016. Deliberative pedagogy in a nonmajors biology course: Active learning that promotes student engagement with science policy and research. *Journal of College Science Teaching* 45(4): 38–45.
- White, P. J., I. Larson, K. Styles, E. Yuriev, D. R. Evans, P. K. Rangachari, J. L. Short, B. Exintaris, D. T. Malone, B. Davie, N. Eise, K. Mc Namara and S. Naidu. 2016. Adopting an active learning approach to Teaching in a research-intensive higher education context transformed staff teaching attitudes and behaviours. *Higher Education Research and Development* 35(3): 619–633.
- Wilson, B. M., P. H. Pollock and K. Hamann. 2007. Does active learning enhance learner outcomes? Evidence from discussion participation in online classes. *Journal of Political Science Education* 3(2): 131–142.
- Yew, T. M., F. K. P. Dawood, K. a/p S. Narayansany, M. K. a/p Palaniappa Manickam, L. S. Jen and K. C. Hoay. 2016. Stimulating deep learning using active learning techniques. *Malaysian Online Journal of Educational Sciences* 4(3): 49–57.