



Edu-Brief

NEWSLETTER

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UNIVERSITY
OF
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RETHINK. REINVENT.

Technology Education advances to excellence in teaching and learning



Mr Pieter Westerberg, Manager: Production maintenance and safety at Aerosud, addressing the students.



Mr Peter du Bruyn, Training manager at Bosch, supervising students in the correct use of power tools to manipulate wood.

Scientifically founded criteria based on research done by Prof Ankiewicz have recently been used for the evaluation of the intended undergraduate technology curricula on offer by the Technology Education Unit within the Department of Science and Technology Education. In some instances the criteria originated from aspects of technology classroom pedagogy, teacher education and STS (Science, Technology and Society) studies, due to how intertwined these aspects are.

The criteria were applied to the learning guides for the majors of undergraduate technology student teachers, namely Engineering Graphics and Technology Education (EGTE) and Civil Technology. The criteria succeeded well in evaluating the specific learning guides comprehensively from a philosophical (i.e. ontological, epistemological, methodological and volitional) perspective.

The criteria revealed that specifically the volitional aspects of technology are largely underplayed in the learning guides. The complex thinking processes and skills which relate to inter alia innovation, entrepreneurial attitude and behaviour as volition should explicitly be included, as well as the complex relationship between Science, Technology and Society (STS).

The underplay of volitional aspects in these majors was addressed by appropriate excursions to subject field related industry. During 2015 the Unit organised two excursions for the students to be exposed to real-life technological situations. During the first excursion on 22 May 2015, the Unit visited Aerosud which is an aeronautical company that manufactures components for Boeing and Airbus. During this excursion the following aspects of volition were addressed:

Appreciation for local industry; development of an awareness of precision in technology; realization of the importance of safety aspects in the work place and valuing the aesthetical aspects regarding finishing.

On 7 August 2015 the unit visited the Bosch Training Center where the students were exposed to practical training in the manipulation of wood. During this excursion the following aspects of volition were addressed: Appreciation for students own abilities; awareness of the role technology can play in their lives; realizing the importance of safety aspects; experiencing the correct use of different tools and equipment and how they relate to material processing and valuing aesthetical aspects.



Technology Education meets with Prof Marc de Vries

The Technology Education Unit was privileged to host Prof Marc de Vries, an international scholar of standing from the Netherlands, for a full day while visiting South Africa as a keynote speaker at the SAARMSTE conference in Pretoria in January 2016.

Marc J. de Vries is Professor of Science and Technology Education at Delft University of Technology, Affiliate Professor of Reformational Philosophy (of technology) at the same institute and Assistant Professor of Philosophy of Technology at Eindhoven University of Technology. He serves as the

editor-in-chief of the International Journal for Technology and Design Education. He is the author of "Teaching About Technology", an introduction to the philosophy of technology for technology educators. He is also responsible for the Pupils' Attitude Towards Technology (PATT) international conference series.

We had discussions about technology education at Heia Safari Lodge on 14 January 2016. Some of the topics that were discussed are pupils' attitudes towards technology, the philosophy of technology, international research

collaboration and the upcoming PATT32 conference in 2016. The focus of the PATT32 conference will be on research and development work related to 21st Century skills and the way technology education can contribute to the development of 21st Century skills. Technology education can be particularly instrumental in developing such skills. Technology entails creativity and innovation, critical thinking, problem solving, decision making, communication and collaboration (teamwork), and therefore qualifies as a domain for enhancing 21st century skills.



Prof Ankiewicz with Prof De Vries at the PATT29 conference which was held in Marseille, France in 2015.



Dr Van As, Prof Ankiewicz, Mr Engelbrecht and Prof De Swardt with Prof De Vries during his visit in January 2016

International What I Find Important [WIFI] research project in Mathematics Education kicks off at UJ

Gerrie J Jacobs

The world-renowned mathematics educator and researcher, Prof Wee Tiong Seah from the Graduate School of Education at the University of Melbourne in Australia, has invited Prof Gerrie Jacobs to lead a mathematics education research team in a collaborative research project. The School of Education at the University of Melbourne is ranked fifth in the world according to the QS world rankings, on the heels of the

UCL Institute of Education in London, Harvard, Stanford and Cambridge Universities. Prof Seah is also the Head of MERGA, the Mathematics Education Research Group of Australasia.

The original *What I Find Important* (WIFI) in mathematics learning research project was initiated by Prof Seah in 2008 through a joint undertaking between the National

Education Institute of Singapore and the University of Monash, where he resided at the time. Twenty one research teams from 17 countries, including Australia, Germany, Japan, USA, Turkey, Thailand, Sweden, Brazil, United Kingdom, Hong Kong, China, Thailand, and others, are currently participating in the project and UJ's name will be added to the list of project teams, making South Africa the 18th participating country.

The broader research project is known as the *Third Wave* project in the domain of mathematics education. First wave studies typically focus on the role that *cognitive* factors (e.g. teaching, self-directedness, assessment, etc.) play in mathematics learning, while second wave studies mainly focus on the role of *affective* factors' like attitudes, beliefs and motivation in mathematics learning. Third wave studies focus on the role of BOTH cognitive and affective factors, but will also increasingly shift its emphasis towards the role of socio-cultural, teaching-learning and learning in mathematics values among mathematics learners. The project's rationale is that without the capacity to assess what mathematics learners at school level have learnt to value, mathematics teachers and lecturers (at University level) will not be able to adequately enhance the teaching and learning of mathematics.

Seven new masters and two new doctoral students in Mathematics Education have Prof Wee Tiong Seah (University of Melbourne) as their supervisors. The four supervisors in the research team are Prof Jacobs, Dr Erica Spangenberg, Ms Kim Ramatlapana (all three from the Mathematics Education Unit in the Faculty of Education), and Dr Melanie Jacobs (Faculty of Science). The 14 members of the research team were introduced to the intricacies of the international project and research in Mathematics Education in general, and they also underwent research capacity development during the week of the 14th of March, when the international project coordinator, Prof Seah visited UJ. Profs Seah and Jacobs also visited two secondary schools (UJ Metropolitan Academy in Crosby and Curro Aurora in Northriding), for the purpose of observing teacher-learner engagement in mathematics classes.



UJ Metropolitan Academy (from left to right): Prof Gerrie Jacobs (UJ), Mss Elsa Snyders and Raeesa Asmail (Mathematics teachers at the school) and Prof Wee Tiong Seah (University of Melbourne).



Curro Aurora: (from left to right): Prof Wee Tiong Seah (University of Melbourne), Mr Johan Ueckermann (Principal of Curro Aurora), Mr Dion Kotze (HOD of Mathematics at Curro Aurora) and Prof Gerrie Jacobs (UJ).



UJ's WIFI project team with Prof Seah:

FRONT ROW – all of them Master's students in Mathematics Education: Ms Dianne Schubert (Dept of Pure and Applied Mathematics), Ms Victoria Chilengi (Mathematics teacher at the British International School), Ms Tendai Madosi (Mathematics teacher at Germiston High School), Ms Cosette Toerien (Faculty of Science's Bridge School for Mathematics and Science), Ms Raeesa Asmail (Mathematics teacher at UJ Metropolitan Academy) and Dr Melanie Jacobs (Head of the Unit for Programme, Enrolment & Quality Management (UPEQ) in the Faculty of Science).

BACK ROW – Mr Jaco Bruyns, PhD student (Dept of Applied Physics & Engineering Mathematics), Mr Wihann van Reenen, Master's student (Faculty of Science's Mathematics Learning Centre), Ms Kim Ramatlapana (Dept of Science & Technology Education), Dr Erica Spangenberg (Dept of Science & Technology Education), Mr Titus Mohubedu, PhD student (Dept of Pure and Applied Mathematics), Prof Wee Tiong Seah (University of Melbourne, international project coordinator), Prof Gerrie Jacobs, UJ project leader (Dept of Science & Technology Education) and Ms Thea Oberholzer, Master's student (Faculty of Science's Bridge School for Mathematics and Science).

Symposium on curriculum ideology at SAARMSTE conference

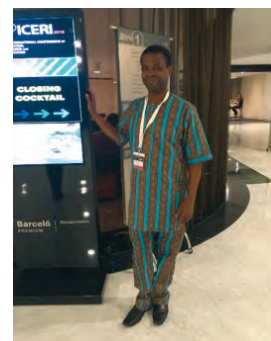
Colleagues in science and mathematics education from the Department of Science and Technology Education presented an interactive symposium at the Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE) conference held at the Tshwane University of Technology from 12 January to 15 January 2016. The UJ panel explored the curriculum ideology represented in school science and mathematics Curriculum and Assessment Policy Statement (CAPS) documents by providing insights from their empirical studies on document analysis. All presentations were well received by the other delegates and stimulated much discussion on how the intent of curriculum reform in South Africa has been translated into curriculum ideology underpinning the CAPS curriculum.

Students and Staff of the Department of Education Leadership and Management attend the ICERI Conference in Seville, Spain

Fifteen M.Ed and Phd scholars, including both national and international scholars from the Department of Education Leadership and Management (DELM), accompanied by four staff members attended the 8th International Conference of Education, Research and Innovation (ICERI) in Spain during November 2015. More than 35 papers were eloquently delivered at the conference which was based on the students and staff's research. En-route to the conference the team visited the Vrije University in the Netherlands where the scholars had the opportunity to engage in a seminar with academics at the University. The team was further enriched with the opportunity to visit a multicultural school in Amsterdam that comprises learners from more than 60 different cultures. The papers that were delivered are available in the published ICERI Conference Proceedings.



DELM scholars and staff with academics and students from Vrije University in the Netherlands



Recent DELM PhD graduate Dr T Olujuwon who is based in Nigeria at the ICERI event

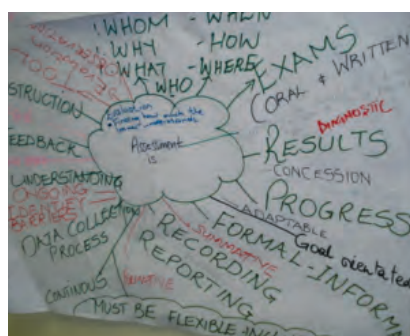


Leaders in Partnership for Professional Development

The Department of Education Leadership and Management (DELM) commenced with a community engagement project in 2015 entitled 'Leaders in Partnership for Professional Development'. One component of the project aimed to offer workshops and seminars to develop leadership and management skills. Together with the Education Leadership Institute (ELI), DELM hosted several community engagement activities with school principals, district leaders and the broader community. In June, Professor Ashleigh Shelby Rosette from the University of North Carolina in the United States of America, presented a workshop on 'Negotiation Skills for Leaders'. Prof Michelle Smith from the Simon Fraser University in Canada presented a seminar on 'Women Leadership' in October. A highlight of the year was the 'Instructional Leadership' seminar presented in October by internationally renowned researcher Professor Hallinger, from the Chulalongkorn University in Thailand. Professor Hallinger further engaged with principals and district officials during a visit to the Uplands College in Mpumalanga accompanied by the entire DELM team. It was the DELM's honour to host Miss Sheri Brynhard, South Africa's first qualified teacher with Down Syndrome who presented an inspiring motivational talk. At the same community engagement programme, DELM further supported the local community by inviting Soweto's String ensemble, Buskaid, whose members are drawn from the previously disadvantaged local community, to open the programme. A final community engagement workshop was held at the end of October by Professor Karen Biraimah from the University of Central Florida in the United States. Her workshop theme was "Responding to diversity with culturally relevant pedagogy".

Training of Educators in Eastern Cape on Remedial Assessment Practices

The educational psychology department presented a Short Learning Programme (SLP) for 120 educators from full service primary schools and district officials from the Eastern Cape Department of Education in East London for 5 days in March 2016. The SLP was grounded in an inclusive philosophy, theories of scholastic assessments and the policy framework. Activities during the SLP focused on developing practical skills in order to design, implement and report on remedial assessments for learners with learning problems. Assessment concession for learners with special needs and working in multi-disciplinary teams was also discussed. This SLP carries 30 credits at NQF level 7 towards the Advanced Diploma in Remedial Education (HEQC Accreditation: H/H07/E38CAN SAQA ID: 93730).



“Using Life Design With Vulnerable Youth”

An article by Miss Rubina Setlhare-Meltor appeared in The March Special Edition of The Career Development Quarterly

UJ 2nd year M Ed Educational Psychology students at Rahima Moosa



Rubina Setlhare-Meltor initiated a project with the Psychological Support Unit at the Rahima Moosa Mother and Child hospital in Coronationville. Five of our second year Educational Psychology Masters students form part of a multidisciplinary team at the hospital to provide support to children and adolescents who have been referred to the hospital for a variety of psychological challenges. Our students will work with existing hospital staff and intern psychologists from the Humanities faculty at UJ, to assess the child/adolescent's cognitive strengths and challenges in the context of the reason for referral. Relevant recommendations and a detailed support plan will be designed in collaboration with the parents, for the children/adolescents. The UJ Educational Psychology students had an orientation session on 8 March and start working with clients on 14 March 2016.

NRF-funded community based action research project

In 2013, teachers at a South African township school in a peri-urban area of the North west province, expressed a need for support with addressing psychosocial challenges facing their learners. They were

becoming demotivated by the reality of teaching in socio-economically challenged community. This in turn was leading to the erosion of quality of teaching and learning and lowering their perceptions of personal and professional efficacy. There was thus a need to explore pathways that could assist teachers to provide pastoral support to learners, in a way that would enable them to develop both professionally and personally. Drawing on positive psychology, Rubina Setlhare-Meltor engaged with these teachers and collaboratively initiated a community-university partnership which explored a participatory action learning and action research (PALAR) approach to assist these teachers to work collaboratively as co-researchers to identify and address psychosocial challenges at their school. Ten volunteer teachers participated in the generation of qualitative data through relationship building activities, individual interviews, the creation of visual artefacts with narratives and informal group discussions.

Over a period of 3 months the teachers identified 28 contextual challenges which they placed into 4 categories. Three challenges were prioritised for intervention over 6

months as represented in the collage below. The collage was created by teachers and learners in the project which prioritises the following identified challenges:

Children carrying adult responsibilities

Teenage Pregnancy related to risky behaviour

Substance abuse

A thematic coding of the data suggests that teachers were able to gain a deeper understanding of the need to develop a collaborative and sustainable response to address learner psychosocial challenges; that they were able to work together to create a vision to guide them to begin to take action as a support team; and that they have begun to take ownership of the project, allowing me to play a more facilitative role. The process was not without its challenges, but the preliminary findings appear to confirm the potential of PALAR for conducting community based educational research as a form of community engagement. The LRC and parents also invited to join the project which was then collaboratively named 'Fatlhogang' [to be enlightened].

Some of the interventions as collaboratively decided on include:

- a) Teachers attended workshop with District officials for supporting learners through referral to relevant structures.
- b) Teachers gathered statistics for children at the school, living without adult supervision to present to Social Development.
- c) Learners with substance abuse challenges and financial challenges are being referred but bureaucracy is a huge challenge.
- d) Teachers collaborated with FAMSA on 8-week programme to create awareness and give support for teenage pregnancy at Gr 8 and 9 level- full report on process and learner responses

- e) Learners started a veggie garden with support from local municipality and NWU Anthropology
- f) Learners in the Fatlhogang project installed a suggestion box at school for all learners to advise on how to address the contextual psychosocial challenges.
- g) A NWU social work project to support jobless fathers in Gr 8 group was initiated, but challenges presented with parent participation.
- h) Request for Community Development capacity: University of Johannesburg: 2016

The pictures on the right include teachers, learners and parents who are part of this community-based participatory action research project. Time is the biggest challenge with this project where community partners volunteer in addition to other demanding life roles. Illness, death, retirement and resignation of participants has also caused temporary derailing of process, but those who remain are continuing.



The Department of Educational Psychology hosts Public Lecture



The Department of Educational Psychology was privileged to host Professor Lani Florian for a public lecture on 23 February 2016, speaking on 'Re-imagining support for all students – why a new approach is needed'. Professor Florian is from Edinburgh University in the UK. She is the Bell Chair of Education and Director of Research and Knowledge Exchange, Education, Teaching and Leadership. Her principal interests are Inclusive pedagogy; achievement and inclusion in schools; special educational needs; and international developments in 'Education for All'. Professor Florian has over twenty years experience in higher education as a teacher educator and researcher. She has extensive international experience in special needs education and has worked on issues of disability classification, teacher education and inclusive education with a number of international agencies including UNICEF and the Organisation for Economic Cooperation and Development. Professor Florian is a member of the American, British and European Educational Research Associations and co-convenor of the Research Methodology Special Interest Group of the British Educational Research Association. She serves on the board of four academic journal and in 2012 was elected Academician of the Academy of Social Sciences.

Article 24 of the United Nations Convention on the Rights of Persons with Disabilities has affirmed the rights-based nature of inclusive education by specifying that 'persons with disabilities receive the support required, within the general education system, to facilitate their effective education' (UN, 2006, Article 24.1.d). While the availability of specialised support is seen as an important aspect of an inclusive education, there are questions about how this support can be provided without perpetuating the problems of exclusion that are created when some students are identified as having difficulties in learning. This lecture identified some key problems with traditional approaches to additional support and argued that a shift in thinking about how support is provided can open up new possibilities for practice that avoids the marginalisation that can occur when some students are treated differently to others. Examples of how this shift in thinking can change practice were provided.

This public lecture was sponsored by funds from the National Research Foundation in a joint project between UJ, the University of Limpopo – Prof Themane, and led by Dr Elizabeth Walton from the University of Witwatersrand. This NRF project focuses on initial and in-service training of teachers in inclusive education across various institutions.

Teacher Education for Inclusion

The Department of Higher Education has initiated the Teaching and Learning Development Capacity Improvement Programme where the focus is on implementing a new programme to strengthen and assist with capacity development in selected areas of teacher education over the next five years. After the symposium on 'Teacher Education for Inclusion,' held in October 2015, Dr Mirna Nel from North-West University, Dr Elizabeth Walton from Wits University and Jean Fourie from the University of Johannesburg met with Dr Whitty Green, Director: Initial Professional Education of Teachers at the DHET. The purpose of this meeting was to advance the impetus started by the inclusion symposium by considering the extent to which teacher education programmes embrace an inclusive education stance. As a result delegates from all 26 South African universities attended a workshop in February 2016 at Wits University, to specifically investigate inclusive education within teacher training programmes and to plan a way forward. All delegates were firstly provided the opportunity to report on how their Initial Teacher Education Programmes address inclusion and diversity. Some universities do not refer to inclusive education at all in their programmes and most deal with it in separate modules rather than infused throughout the curriculum and informing pedagogical practices. Professors Lani Florian and Martyn Rouse from Edinburgh University in Scotland then presented their research on how inclusive education was successfully integrated into their teacher education programmes in Scotland. Their visit was sponsored by an NRF project on 'Teacher Education for Inclusive Education' led by Dr Walton, Prof Themane and Ms Jean Fourie. As a way forward a task team was selected, representing different regions, to analyse teacher education programmes and find a strategy to ensure that inclusive education is infused in all initial teacher education programmes. This task team will present their findings in the next few months.

Editorial Team

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New Short Learning Programme: Professionalism in Mentoring.

The Department of Educational Psychology has recently completed an international research project on learning conversations in mentoring, in collaboration with Prof Harm Tillema from Leiden University in the Netherlands. This project resulted in a research book published by Sense publishers, with contributions from various universities and fields. This book forms the basis of the short learning programme, designed to promote professionalism in mentoring and is made available to UJ staff, but also to participants from other institutions.

The SLP Professionalism in mentoring is a formally approved UJ offering of 20 credits on NQF8, and will be made available for at least two offerings in 2016.

This is a (mainly) self-directed course for academic staff in teaching and research to create learning conversations with their students which will enable mentees to "climb the mountain", i.e., for "knowledge productive learning" in line with personal and professional goals.

The course addresses the need to have committed and informed mentors in the university, and to contribute to building professionalism in mentoring.

- To study current approaches, models and strategies of mentoring
- To understand and do mentoring conversations as learning conversations
- To develop knowledge and growth in expertise as a community of mentors in the institution

What is unique about this programme is the focus on mentoring conversations for learning – it encourages mentors to consider the important role they play in time of curriculum change, and the calls for decolonizing knowledge.

Three domains of knowledge and skills in mentoring are addressed in this course. They constitute three elements in understanding mentoring conversations as learning conversations.

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Editorial

This, the first issue of EduBrief for 2016, reflects several success and highlights of the Faculty of Education in the previous four months. There is notable success in the Department of Science and Technology Education. Under the leadership of Prof Piet Ankiewicz, the Department introduced recognition of their students in the shape of an awards ceremony. Apart from this, international visitors and partnerships continue to ensure that this department is a vibrant centre of learning.

Another department that has initiated valuable projects is the Department of Educational Leadership and Management, under the leadership of Prof Juliet Perumal and Prof Coert Look. This department has developed a community project, initiated in 2015, and members of the department have been visible participants at international conferences.

The Department of Educational Psychology, under the leadership of Dr Helen Krige, has engaged in the development of several courses in their discipline, as well as hosting an internationally renowned academic to present a public lecture.

There is clear evidence that 2016 has begun in a manner that suggests that the Faculty is a centre of scholarship and academic development.



Department of Science and Technology Education hosts first prize giving event for top achiever students of 2015

The need to and dividends of recognising outstanding student achievement is increasingly realised and practised by universities, faculties, schools or departments worldwide. Besides the motivational and promotional value of such events, they serve as a showcase of the work, dedication and talent of enrolled students, and of course also of their lecturers and supervisors.

On the 15th of March 2016, the Department of Science and Technology Education (SciTechEd), for the first time in its history, staged an event, during which its top student achievers from 2015 (at both under- and postgraduate levels) were suitably honoured. The glamorous early-evening occasion was hosted in the Council Chambers of the University, and 14 awards were made to deserving and outstanding students in the domains of Learning Technologies in Education, Mathematics Education and Science Education. The awardees were accompanied by some of their family members, friends or colleagues, who treasured the opportunity to share in the wonderful achievement of their loved ones.

Besides all members of staff of the hosting department, the event was also attended by senior staff from the Faculty of Education. The important contribution of the Faculty of Science, who teaches the core modules (specifically in Mathematics and Science) to these students, was also confirmed and acknowledged. The Science Faculty was represented in person by the Vice-dean: Teaching and Learning, Prof Ina Wagenaar, as well the Head of the Unit for Programme, Enrolment and Quality Management, Dr Melanie Jacobs.

A unique feature of the event was brief presentations by the 'Best dissertation master's student in Learning Technologies in Education', Ms Anna Coetzee, a staff member in the Centre for Academic Technologies (CAT) at UJ, as well as by the 'Best dissertation master's student in Mathematics Education', Ms Wendy Baumgartner, who lectures Mathematics in the Higher Certificate in Higher Education Studies at Monash South Africa. Both Mss Coetzee and Baumgartner introduced their respective master's studies to the appreciative audience, and were 'rewarded' via thunderous ovations afterwards.

The Head of the Department of Science and Technology Education (SciTechEd), Prof Piet Ankiewicz, afterwards regarded the Top Achievers' event as a "notable success". He also revealed that the event is sure to become an annual feature on the department's calendar, because in the words of the French writer, Voltaire, 'Appreciation is a wonderful thing. It makes what is excellent in others belong to us as well'.



Prof Wee Tiong Seah, renowned mathematics educator from the University of Melbourne in Australia, who was also invited to the Top Achievers' event, is flanked by Dr Melanie Jacobs, Head of the Unit for Programme, Enrolment and Quality Management in the Faculty of Science (on the left) and Prof Ina Wagenaar, Vice-Dean: Teaching and learning of the Faculty of Science (on the right).



Dr Rabaitse Diseko presents the award for the *Best B.Ed student in Information and Communication Support* in 2015, to Ms Chanica Gibhard.



Prof Duan van der Westhuizen presents the award for the *Best B.Ed Honours student in Learning Technologies in Education* in 2015, to Mr Mpho Mongake.



Prof Umesh Ramnarain presents the award for the *Best B.Ed Honours student in Science Education* in 2015, to Ms Memory Malope.



Dr Erica Spangenberg presents the award for the *Best B. Ed Honours student in Mathematics Education* in 2015, to Ms Yumna Khatib. This award was shared with Ms Raeesa Asmail.



Ms Anna Coetzee (Centre for Academic Technologies (CAT) at UJ), who received the award for the *Best dissertation master's student in Learning Technologies in Education*, introduces the findings of her study to the audience.



Ms Wendy Baumgartner, mathematics lecturer at Monash SA, who received the award for the *Best dissertation master's student in Mathematics Education*, introduces the findings of her study to the audience.



SciTechEd's top achievers of 2015 were:

Front (left to right): Ms Yumna Khatib (Honours in Mathematics Education –shared with Ms Asmail), Ms Annesca Pieters (Coursework Master's in Science Education), Ms Abigail Robberts (Coursework Master's in Mathematics Education) and Ms Chanica Gibhard (B.Ed in Information and Communication Support)

Middle (left to right): Ms Wendy Baumgartner (Dissertation Master's in Mathematics Education), Ms Anna Coetzee (Dissertation Master's in Learning Technologies in Education), Ms Raeesa Asmail (Honours in Mathematics Education – shared with Ms Khatib), Ms Prudence Magadlela (PGCE in Mathematics Education), Ms Khanyisile Masikane (B.Ed in Science Education (Life Sciences) –shared with Mr Ngubane) and Ms Memory Malope (Honours in Science Education)

Back (left to right): Ms Mpho Mangake (Honours in Learning Technologies in Education), Mr Gordon Ngubane (B.Ed in Science Education (Life Sciences) –shared with Ms Khanyisile) and Mr Patrick Ntsibande (B.Ed in Science Education (Physical Sciences)).