

CURRICULUM VITAE: UMESH RAMNARAIN

PERSONAL INFORMATION

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| TELEPHONE NO. | 011-5594384 |
| E-MAIL | uramnarain@uj.ac.za |
| SURNAME: | Ramnarain |
| FIRST NAME: | Umesh |
| GENDER: | Male |
| MARITAL STATUS: | Married |
| NATIONALITY: | South African |
| HOME LANGUAGE: | English |
| CRIMINAL OFFENCES: | None |
| HEALTH: | Excellent |
| LICENCE: | Code 08 |

EDUCATIONAL QUALIFICATIONS

SCHOOL EDUCATION

LAST SCHOOL ATTENDED: Asoka Secondary (1980-1985)
HIGHEST STANDARD PASSED: Matric with exemption
SUBJECTS: English, Afrikaans, Mathematics,
Physical Science, Biology, Accounting

HIGHER EDUCATION

Bachelor of Science degree (1986-1990)

Institution: University of Durban-Westville
Courses: Chemistry III, Maths III Physics II, Biology I

Higher Diploma in Education (1992)

Institution: University of Durban-Westville
Courses: Physical Science, Mathematics, Curriculum Studies, English Usage

Bachelor of Education Degree (1995-1996)

Institution: UNISA
Courses: Curriculum Development, Curriculum Theory, Introduction to Didactics, Themes in Didactics, Research in Education, Quantitative Research in Education, Comparative and International Education, Psychology of Education 1, Orthopedagogsics 1, Philosophy of Education 1

Master of Education degree (1997-1999)

Institution: UNISA
Dissertation in full completion of degree

Topic: An investigation of a strategies-based problem solving approach in mathematics at the Grade 8 level.

PhD (2003-2007)

Institution: University of KwaZulu-Natal, Durban
Thesis in full completion of degree

Topic: A study of the implementation of scientific investigations at Grade 9 with particular reference to the relationship between learner autonomy and teacher support

Attended FET assessors' course (IEB) (2006)

Modules in Information Systems and Statistics (1993)

Institution: UNISA

Course in Microcomputer Applications (1990)

Institution: JBN Technology Services

EMPLOYMENT HISTORY

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| Educator: | Lenasia South Secondary School (1992-1993) |
| Subjects taught: | Physical Science, Mathematics, General Science |
| Grades: | 8-12 |
| Educator: | Montarena Secondary School (1994-2003) |
| Subjects taught: | Physical Science, Mathematics, Natural Science |
| Grades: | 8-12 |
| Educator | Kharwastan Secondary School (2003-2004) |
| Subjects taught | Physical Science |
| Grade | 10-12 |
| Part-time tutor | Upward Bound Programme, University of Durban-Westville (2002) |
| Part-time lecturer | BEd. Module (SMATE), University of Port Elizabeth (2003) |
| Head of Department (Science/Mathematics) | Westville Boys' High School (2005-2007) |
| Part-time lecturer | University of KwaZulu-Natal (2007) |
| Senior Lecturer/ Lecturer | University of Johannesburg (2008-2012) |
| Associate Professor | University of Johannesburg (2012-2014). Lecturing Physical Sciences subject methodology modules for BEd/PGCE, BEd(hons) and MEd. Currently supervising Masters and PhD students. |
| Full Professor | University of Johannesburg (2015-current). Lecturing MEd (science education). Currently supervising Masters and PhD students, NRF Rated (C3) |
| Coordinator of Science Education Unit | University of Johannesburg (2015-2017) |
| Head of Department | Science and Technology Education, University of Johannesburg (current) |

RESEARCH OUTPUT

A. Publications in Scientific Journals

1. Ramnarain, U. (2003). A strategies-based problem solving approach in the development of mathematical thinking. *Pythagoras*, 57, 32-35.
2. Ramnarain, U. (2010). Grade 9 science teachers' and learners' appreciation of the benefits of autonomous science investigations. *Education as Change*, 14(2), 187-200.
3. Ramnarain, U. (2010). A report card on learner autonomy in science investigations. *African Journal of Research in Mathematics, Science and Technology Education*, 14(1), 61-72.
4. Ramnarain, U. (2011). Teachers' use of questioning in supporting learners doing science investigations. *South African Journal of Education*, 31(1), 91-101.
5. Ramnarain, U. (2011). Equity in science education in South Africa: A pious platitude or an achievable goal. *International Journal of Science Education*, 33(10), 1353-1371.
6. Ramnarain, U. & Nkhase, S. (2011). How Grade R pupils make sense of the images of "scientist" and "science". *South African Journal of Childhood Education*, 1(2), 143-157.
7. Ramnarain, U. (2012). The use of cartoons in effecting a shift from a sage-on-stage to a learner-on-stage environment in practical work. *Perspectives in Education*, 30(2), 50-61.
8. Ramnarain, U. & Molefe, P. (2012). The readiness of high school students to pursue first year physics. *Africa Education Review*, 9(1), 142-158
9. Ramnarain, U. & Van Niekerk, C. (2012). Student naïve conceptions in a grade 12 physics examination. *African Journal of Research in Mathematics, Science and Technology Education*, 16(1), 112-125.
10. Ramnarain, U. (2012). The readability of a high stakes physics examination. *Acta Academica*, 44(2), 110-129.
11. Ramnarain, U. & Joseph, A. (2012). Learning difficulties experienced by grade 12 South African students in the chemical representation of phenomena. *Chemistry Education Research and Practice*, 13, 462-470.
12. Ramnarain, U. & Ramaila, S. (2012). Mentoring as a viable and sustainable form of professional development for Physical Sciences teachers. *Education as Change: Journal of Curriculum Research*, 16(2), 255-268.
13. Ramnarain, U. & Fortus, D. (2013). South African physical sciences teachers' perceptions of new content in a revised curriculum. *South African Journal of Education*, 33(1), 1-15.
14. Ramnarain, U. & De Beer, J. (2013). Science students creating hybrid spaces when engaging in an expo investigation project. *Research in Science Education*, 43, 99-116.
15. Ramnarain, U. & Modiba, M. (2013). Critical friendship, collaboration and trust as a basis for self-initiated professional development: A case of science teaching. *International Journal of Science Education*, 35(1), 65-85.
16. Ramnarain, U. (2013). The achievement goal orientation of disadvantaged Physical Sciences students from South Africa. *Journal of Baltic Science Education*, 12(2), 139-151.

17. Ramnarain, U. (2014). Empowering educationally disadvantaged mathematics students through a strategies-based problem solving approach. *The Australian Educational Researcher*, 41(1), 43-57.
18. Ramnarain, U. (2014). Teachers' perceptions of inquiry-based learning in urban, suburban, township and rural high schools: The context-specificity of science curriculum implementation in South Africa. *Teaching and Teacher Education*, 38, 65-75.
19. Ramnarain, U. & Schuster, D. (2014). The pedagogical orientations of South African Physical Sciences teachers toward inquiry or direct Instructional Approaches. *Research in Science Education*, 44(4), 627-650.
20. Ramnarain, U. (2014). Questioning the validity of inquiry assessment in a high stakes physical sciences examination. *Perspectives in Education*, 32(1), 179-191.
21. Ramnarain, U. & Ramaila, S. (2014). The achievement goals orientation of South African first year university students. *International Journal of Science and Mathematics Education*, 14, 81-105.
22. Ramnarain, U. & Hobden, P. (2015). Shifting South African learners towards greater autonomy in scientific investigations. *Journal of Curriculum Studies*, 47(1), 94-121.
23. Ramnarain, U. & Padayachee, K. (2015). A comparative analysis of South African Life Sciences and Biology textbooks for the inclusion of the nature of science. *South African Journal of Education*, 35(1), 1-8.
24. Ramnarain, U. (2015). A Pilot Study on the Mentoring of PGCE Physical Sciences Students at a Teaching School. *Procedia-Social and Behavioral Science*, 167, 44-49.
25. Kyriacou, X., De Beer, J. & Ramnarain, U. (2015). Evolutionary ideas held by experienced South African Biology teachers. *African Journal of Research in Mathematics, Science and Technology Education*, 19(2), 118-130.
26. Ramnarain, U. (2015). Connecting the Hands-On to the Minds-On: A Video Case Analysis of South African Physical Sciences Lessons for Student Thinking. *Eurasia Journal of Mathematics, Science & Technology Education*, 11(5), 1151-1163.
27. Ramnarain, U. Nampota, D. & Schuster, D. (2016). Spectrum of Pedagogical Orientations of Malawian and South African Physical Science Teachers towards Inquiry. *African Journal of Research in Mathematics, Science and Technology Education*, 20(2), 119-130.
28. Ramnarain, U. (2016). Understanding the influence of intrinsic and extrinsic factors on inquiry-based science education at township schools in South Africa. *Journal of Research in Science teaching*, 53(4), 598-619.
29. Ramnarain, U. & Chanetsa, T. (2016). An analysis of South African Grade 9 natural sciences textbooks for their representation of nature of science. *International Journal of Science Education*, 38(6), 922-933.
30. Ramnarain, U. & Moleki, B. (2017). Teachers' use of newspaper articles in promoting a humanistic perspective of science in South Africa. *Journal of Science Teacher Education*, 28(2), 205-217.
31. Mavuru, L. & Ramnarain, U. (2017). Teachers' knowledge and views on the use of learners' socio-cultural background in teaching natural sciences in grade 9 township classes. *African Journal of Research in Mathematics, Science and Technology Education*, 21(2), 176-182.

32. Ramnarain, U. & Moosa, S. (2017). The Use of Simulations in Correcting Electricity Misconceptions of Grade 10 South African Physical Sciences Learners. *International Journal of Innovation in Science and Mathematics Education*, 25(5), 1-20.
33. Lehesvuori, S., Chan, K., Ramnarain, U. & Viiri, J. (2017). In Search of Dialogicity: A Comparison of Curricular Documents and Classroom Interactions from Finland and Hong Kong. *Education Sciences*, 7(4), 76.
34. Lehesvuori, S., Ramnarain, U. & Viiri, J. (2018). Challenging transmission modes of teaching in science classrooms: enhancing learner-centredness through dialogicity. *Research in Science Education*, 48(5), 1049-1069.
35. Mupira P. & Ramnarain U. (2018). The effect of inquiry-based learning on the achievement goal-orientation of grade 10 physical sciences learners at township schools in South Africa. *Journal of Research in Science Teaching*, 55(6), 810-825.
36. Mavuru, L. & Ramnarain, U. (2018). Relationship between teaching context and teachers' orientations to science. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(8), 1-14.
37. Ramnarain, U. & Hlatshwayo, M. (2018). Teacher beliefs and attitudes about inquiry-based learning in a rural school district in South Africa. *South African Journal of Education*, 38(1), 1-10.
38. Ramnarain, U. & Ramaila, S. (2018). The relationship between chemistry self-efficacy of South African first year university students and their academic performance. *Chemistry Education Research and Practice*, 19(1), 60-67.
39. Upahi, J.E. & Ramnarain, U. (2018). Representations of Chemical Phenomena in Secondary School Chemistry Textbooks. *Chemistry Education Research and Practice*, DOI: 10.1039/
40. Upahi, J.E., Ramnarain, U. & Ishola, I.S. (2018). The Nature of Science as Represented in Chemistry Textbooks Used in Nigeria. *Research in Science Education*, <https://doi.org/10.1007/s11165-018-9734-7>
41. Penn, M. & Ramnarain, U. (2019). South African university students' attitudes towards chemistry learning in a virtually simulated learning environment. *Chemistry Education Research and Practice*, 20, 699-709.
42. Penn, M. & Ramnarain, U. (2019). A comparative analysis of virtual and traditional laboratory chemistry learning. *Perspectives in Education*, 37(2), 80-97.

B. Conference presentations

Ramnarain, U. (2009). *Shifting students towards greater autonomy in scientific investigation: Developing a model of teacher support*. A paper presented at 54th ICET World Assembly, Muscat, Oman.

Ramnarain, U. (2010). *Equity in the implementation of practical science investigations*. A paper presented at the 18th Southern African Association for the Advancement of Research in Mathematics, Science and Technology Education (SAARMSTE) conference, Durban, South Africa

Ramnarain, U. (2010). *Questioning the validity of a high stakes Physics examination paper in view of its readability*. A paper presented at the the Institute of Science and Technology Education (ISTE) Conference on Mathematics, Science and Technology Education, Kruger National Park, South Africa.

Ramnarain, U. (2011). *The use of cartoons in shifting students towards greater autonomy in planning investigations*. A paper presented at the 19th Southern African Association for the Advancement of Research in Mathematics, Science and Technology Education (SAARMSTE) conference, Mafikeng, South Africa.

Ramnarain, U. (2011). *Defining the readiness of high school students to pursue first year university physics*. A paper presented at the Annual National Association of Research in Science Teaching (NARST) International Conference, Orlando, Florida, USA.

Ramnarain, U. & Ramaila, S. (2012). *Mentoring of physical sciences teachers in a community of practice*. Paper presented at the 20th Southern African Association for the Advancement of Research in Mathematics, Science and Technology Education (SAARMSTE) conference, Lilongwe, Malawi.

Van der Westhuizen, G.J., Maseko, L., Van Lelyveld, K., Ramnarain, U., De Beer, J.J.J, & Kakoma, L. (2012). *Using assessment to inform standards: Findings from a script analysis project*. Paper presented at the Umalusi conference, Johannesburg, South Africa.

Ramnarain, U. (2013). *Identifying the goal orientation of disadvantaged Physical Sciences students in South Africa*. Paper presented at the Episteme-5 conference, Mumbai, India.

Ramnarain, U. (2013). *The pedagogical orientation of South African physical sciences teachers in inquiry teaching*. Paper presented at the European Science Education Research Association (ESERA) conference in Nikosia, Cyprus.

Ramnarain, U. (2014). *A case study on the influence of environmental factors on the implementation of science inquiry-based learning at a township school in South Africa*. Paper presented at the 22nd Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE) conference in Port Elizabeth.

Mamutse, K. & Ramnarain, U. (2014). *Exploring the use of improvised physical resources in the implementation of inquiry-based science teaching and learning in grade 9 natural sciences*. Paper presented at the Institute of Science and Technology Education (ISTE) Conference on Mathematics, Science and Technology Education at the Kruger National Park, South Africa.

Moleke, B. & Ramnarain, U. (2014). *Exploring teacher use of newspaper articles in promoting a humanistic perspective in science teaching and learning*. Paper presented at the Institute of Science and Technology Education (ISTE) Conference on Mathematics, Science and Technology Education at the Kruger National Park, South Africa.

Chanetsa, T. & Ramnarain, U. (2014). *A pilot study of the use of an analytical framework for a representation of the nature of science (NOS) in a grade 8 natural sciences textbook*. Paper presented at the Institute of Science and Technology Education (ISTE) Conference on Mathematics, Science and Technology Education at the Kruger National Park, South Africa.

Mavuru, L. & Ramnarain, U. (2014). *The awareness, perceptions and experiences of grade 9 natural sciences teachers of the role of learners' socio-cultural background in teaching and learning*. Paper presented at the Institute of Science and Technology Education (ISTE) Conference on Mathematics, Science and Technology Education at the Kruger National Park, South Africa.

White, L., De Beer, J. & Ramnarain, U. (2014). *"One size does not fit all": curriculum support groups as structured support for teachers' professional development*. Paper presented at the Institute of Science and Technology Education (ISTE) Conference on Mathematics, Science and Technology Education at the Kruger National Park, South Africa.

Ramaila, S. & Ramnarain, U. (2014). Perceptions of South African Physical Sciences teachers on lesson planning in a new curriculum. Paper presented at the Annual Conference of the South African Institute of Physics (SAIP), Johannesburg, South Africa.

Ramaila, S. & Ramnarain, U. (2014). A CHAT perspective on the tensions and dynamics in the professional development of Physical Sciences teachers in a mentoring relationship. Paper presented at the Annual Conference of the South African Institute of Physics (SAIP), Johannesburg, South Africa.

Ramaila, S. & Ramnarain, U. (2014). First year university physics students' perceptions of the teaching-learning environment: In search of a coherent pedagogic learning orientation. Paper presented at the annual conference of the South African Institute of Physics (SAIP), Johannesburg, South Africa.

Ramnarain, U. (2014). A pilot study on the mentoring of PGCE Physical Sciences students at a teaching school in South Africa. Paper presented at the conference of the International Organisation for Science and Technology Education (IOSTE) in Kuching, Malaysia.

Ramnarain, U. (2014). A study on the science content storyline of South African chemistry lessons. Paper presented at the International Science Education Conference (ISEC) conference in Singapore.

Ramnarain, U. & Chisveto, P. (2015). Exploring the influence of school management on the "achievement goal orientation" of grade 10 South African Physical Sciences learners at township schools. Paper presented at the International Conference of Science Educators and Teachers (ISET) in Bangkok, Thailand.

Ramaila, S. & Ramnarain, U. (2015). University physics students' views about scientific inquiry. Paper presented at the Annual Conference of the South African Institute of Physics (SAIP), Port Elizabeth, South Africa.

Ramaila, S. & Ramnarain, S. (2015). Exploring teachers' baseline knowledge of mechanics. Paper presented at the Annual Conference of the South African Institute of Physics (SAIP), Port Elizabeth, South Africa.

Ramnarain, U. & Mamutse, K. (2016). The use of improvised resources in inquiry-based teaching in South Africa. Paper presented at the European Science Education Research Association (ESERA) conference in Helsinki, Finland.

Moosa, S. & Ramnarain, U. (2016). Using a three tier multiple-choice diagnostic questionnaire to identify the misconceptions that grade 10 learners from three under-performing Dinaledi schools in Soweto hold about simple electric circuits. Paper presented at the 24th Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE) conference in Pretoria.

Mupira, P., Ramnarain, U. & Kyriacou, X. (2016). Validating a questionnaire instrument for investigating the achievement goal orientation of Grade 10 Physical Sciences learners in five Soweto township schools. Paper presented at the 24th Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE) conference in Pretoria, South Africa.

Mavuru, L. & Ramnarain, U. (2016). A case study on the incorporation of learners' sociocultural background in the teaching of Natural Sciences at three township schools in South Africa. Paper presented at the 24th Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE) conference in Pretoria, South Africa.

Mavuru, L. & Ramnarain, U. (2017). Role of Contextual Knowledge in the Pedagogical Content Knowledge of Grade 9 Natural Sciences teachers in Johannesburg. Paper presented at the 25th Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE) conference in Bloemfontein, South Africa.

Ramaila, S. & Ramnarain, U. (2017). The pedagogical orientation of pre-service teachers in teaching physics. In Proceedings of the International Conference on Education and New Developments (END), Lisbon, Portugal, pp. 388-391. ISSN: 2184-044X. ISBN: 978-989-99864-3-5.

Ramaila, S. & Ramnarain, U. (2017). University physics students' views about scientific inquiry. In Proceedings of the International Conference on Education and New Developments (END), Lisbon, Portugal, pp. 397-400. ISSN: 2184-044X. ISBN: 978-989-99864-3-5.

Mavuru, L. & Ramnarain, U. (2017). Role of context in shaping the pedagogical orientations of science teachers. Paper presented at the Institute of Science and Technology Education (ISTE) Conference on Mathematics, Science and Technology Education at the Kruger National Park, South Africa.

Ramaila, S. & Ramnarain, U. (2017). Exploring in-service teachers' baseline knowledge of mechanics. In Proceedings of the 10th Annual International Conference of Education, Research and Innovation, Seville, Spain.

Ramnarain, U. (2018). A content analysis of South African grade 12 Physical Sciences textbooks for "practices" of inquiry-based learning. Paper presented at the 17th Annual Hawaii International Conference in Education, Honolulu, Hawaii.

Ramnarain, U. & Makhubalo, N. (2018). An empowerment evaluation approach in shifting a South African science teacher towards an inquiry-based pedagogy. Paper presented at the International Science Education Conference (ISEC) conference in Singapore.

Ndumanya, E., Ramnarain, U. & Wu, H.K. (2018). Developing a rubric for analysing the inclusion of "scientific practices" in physical sciences textbooks. In Proceedings of the International Conference on Education and New Developments, Budapest, Hungary, pp. 528-531. ISSN: 2184-044X. ISBN: 978-989-99864-8-0.

Ramnarain, U. & Penn, M. (2018). The effects of scientific literacy on high school science learners' attitudes towards socio-scientific issues: The case of Genetically Modified Organisms. In Proceedings of 15th International Conference on Economics and Social Sciences, Johannesburg, South Africa.

Ramaila, S. & Ramnarain, U. (2018). Assessment of physics practical work using innovative computer-based technology system. In Proceedings of the International Conference on Education and New Developments, Budapest, Hungary, pp. 528-531. ISSN: 2184-044X. ISBN: 978-989-99864-8-0.

Sondlo, A., & Ramnarain, U. (2018). Exploring Pre-Service Science Teachers Physics Pedagogical Orientations towards Their Own Classroom Teaching. A paper presented at the International Conference on Physics Education (ICPE) International Conference at Misty Hills Hotel and Conference Centre, Muldersdrift, South Africa.

Sondlo, A., & Ramnarain, U. (2018, August). The Pedagogical Orientations of Pre-Service South African Physical Sciences Teachers. A paper presented at the XVIII International Organisation for Science and Technology Education (IOSTE) Symposium: Future educational challenges from a science and technology perspectives. 13-17 August, 2018 Malmö, Sweden.

Mupira, P. & Ramnarain, U. (2018). The effect of an inquiry-based pedagogy on the self-efficacy of grade 10 physical sciences learners in South Africa. A paper presented at the XVIII International Organisation for Science and Technology Education (IOSTE) Symposium: Future educational challenges from a science and technology perspectives. 13-17 August, 2018 Malmö, Sweden.

Shivolo, T. & Ramnarain, U. (2018). Pedagogical orientations of Namibian Physical Science teachers in enacting chemistry demonstrations. Paper presented at the Institute of Science and Technology Education (ISTE) Conference on Mathematics, Science and Technology Education at the Kruger National Park, South Africa.

Penn, M. Ramnarain, U. & Wu, H.K. (2019). The relationship between grade 12 learners' understandings about scientific inquiry and achievement in Physical Sciences. A paper presented at the 27th Southern African Association for the Advancement of Research in Mathematics, Science and Technology Education (SAARMSTE) conference, Durban, South Africa.

Penn, M. & Ramnarain, U. (2019). Assessing the role of implicit scaffolding in facilitating virtual physical sciences learning. A paper presented at the Institute of Science and Technology Education (ISTE) Conference on Mathematics, Science and Technology Education at the Kruger National Park, South Africa.

Sondlo, A. & Ramnarain, U. (2019). Exploring the South African physical sciences pre-service teachers pedagogical orientations. In Proceedings of the International Conference on Education and New Developments, Porto, Portugal.

C. Book chapters

Ramnarain, U. & Kibirige, I. (2010). Learning through investigations. In U. Ramnarain (Ed.), Teaching Scientific Investigations (pp. 1-23). Northlands: Macmillan.

Ramnarain, U. (2014). But ma'am, can't we do it our way first? In S. Gravett, K. Merseur & J. De Beer (Eds.), Being a Teacher: A Book of Cases. Cape Town: Pearson.

Ramnarain, U. (2015). School science learners at risk: Inaccessibility and inequity issues. In M.D. Mogano & U. Ramnarain (Eds.), Including the excluded: Educating the vulnerable for the 21st century (pp. 77-87). South Africa: Pearson.

Ramnarain, U. (2017). Distilling Principles for the professional development of science teachers. In M.D. Mogano, S. Mohapi & D. Robinson (Eds.), Realigning Teacher Training in the 21st Century. South Africa: Cengage Learning.

Ramnarain, U. (2017). An analysis of South African school science textbooks for representations of nature of science. In C.V. McDonald & F. Abd-El-Khalick (Eds.), Representations of nature of science in school science textbooks: A global perspective (pp. 188-200). New York: Routledge.

Ramnarain, U. (2018). Coherence in the teaching of South African Chemistry lessons, Science Education. In J. Yeo, T.W. Teo & K.S. Tang (Eds.), Research and Practice in Asia-Pacific and Beyond (pp. 159-176). Singapore: Springer.

Ramnarain, U. (2018). Scientific Literacy in East Asia: Shifting Toward an Inquiry-Informed Learning Perspective. In Y.J. Lee & J. Tan (Eds.), Primary Science Education in East Asia (pp. 201-213). Singapore: Springer.

D. Books

Ramnarain, U. (2010). Teaching Scientific Investigations. Northlands: Macmillan.

Mogano, M.D. & Ramnarain, U. (2015). Including the excluded: Educating the vulnerable for the 21st century. South Africa: Pearson.

E. Research reports

Van der Westhuizen, G.J., Maseko, L, Van Lelyveld, K., de Beer, J., Kakoma, L. & Ramnarain, U. (2010). Towards improving learner performance in the national senior certificate examination – script analysis research report. ISBN 978-0-86970-720-3.

De Beer, J.J.J. & Ramnarain, U. (2010). The implementation of the FET Physical- and Life Sciences curricula: Opportunities and challenges. ISBN 978-0-86970-721-0

F. Book review

Ramnarain, U. (2012). Review of the book Metacognition in Science Education: Trends in Current Research by A. Zohar & Dori, Y.J. (Eds.), *International Journal of Environmental and Science Education*, 7(2), 361-363.

RESEARCH PROJECTS AND FUNDING

- University Research Committee (URC) funded project: A study on the use of cartoons in engaging learners to design their own investigations; 2009-2010.
- Gauteng Department of Education funded research project: The implementation of the NCS for Physical Sciences: 2009-2010.
- Gauteng Department of Education funded research project: The analysis of the 2008 Grade 12 Physical Sciences examination scripts: 2009-2010.
- National Research Foundation (NRF) funded research project, focusing on the professional development of science teachers within ecologies of practice; Dr Josef de Beer and Dr Umesh Ramnarain; 2007-2011.
- National Research Foundation (NRF) funded research project: The Pedagogical Content Knowledge (PCK) of Physical Sciences teachers in inquiry science teaching: Prof Umesh Ramnarain; 2013-2016
- University Research Committee (URC) funded project: An analysis of South African school science textbooks for the representation of the nature of science; 2014-2017
- National Research Foundation (NRF): Incentive funding for rated researchers' grant; 2016-2019
- National Research Foundation (NRF). Competitive Programme for Rated Researchers: The technological pedagogical content knowledge (TPACK) development of physical science teachers; 2017-2019.
- University Research Committee (URC) funded project: An analysis of South African school science textbooks for the representation of the nature of science; 2014-2017

- University Research Committee (URC) funded project: Pre-service teachers' use of virtual reality laboratories in inquiry-based learning (2019)
- National Research Foundation (NRF). Human and Social Dynamics in Development Grant: The lived experiences of sciences teachers in the enactment of an inquiry-based; 2018-2020.

SUPERVISION OF STUDENT RESEARCH

PhD supervision

- Neal Petersen (2011): Ondersoek na die implementering van 'n aktiwiteit-gebaseerde benadering in die bereiking van die Leeruitkomstes in Lewenswetenskappe soos uitgestippel in die Nasionale Kurrikulumverklaring. (co-supervisor)
- Sam Ramaila (2012): Mentoring as a form of professional support for Physical Sciences teachers within a community of practice
- Xenia Kyriacou (2013): A design-based study of the effect of an evolution education short learning programme on the conceptual development of participants with a view to theory building and improvement of practice. (co-supervisor)
- Lounell White (2012): Curriculum support groups as ecologies of practice for teacher development. (co-supervisor)
- Anastasia Buma (2015). A short intervention programme to develop science teachers' pedagogical content knowledge to teach for the affective domain. (co-supervisor)
- Lydia Mavuru (2016): Exploring the role of contextual knowledge in the pedagogical content knowledge of Grade 9 Natural Sciences teachers: A case study of township teachers in South Africa
- Andonis Antoniou (2017): Scaffolding professional development of science teachers within a school-based community of practice: a case study (co-supervision)
- Pio Mupira (2017): An investigation of the effect of inquiry-based learning on the achievement goal orientation of grade 10 Physical Sciences learners, with particular reference to gender differences
- Clive Rudzirai (2019): Enhancing the pedagogical practice of South African Physical Sciences teachers in inquiry-based teaching through empowerment evaluation

Masters supervision

- Celeste van Niekerk (2011): Misconceptions in a high stakes physics examination
- Ruth Letsoalo (2011): Exploring the teacher use of cartoons as a learner scaffold in the planning of scientific investigations in grade 9
- Gurtug Yalvac (2011): Barriers in the teaching and learning of evolutionary biology amongst Muslim teachers and learners (co-supervision)
- Annelize Cronje (2011): The professional development of science teachers for the implementation of a new curriculum (co-supervision)
- Aleyamma Joseph (2011): Grade 12 learners' conceptual understanding of chemical representations
- Keshni Padayachee (2012): A study on the analysis and use of Life Science textbooks in promoting the nature of science
- Melida Mothwa (2012): Teachers' experiences of incorporating Indigenous Knowledge in the Life Sciences classroom (co-supervision)
- Camantha Reddy (2012): The lived experiences of Hindu teachers and learners in the teaching and learning of evolution in Life Sciences in the FET phase. (co-supervision)

- Sipho Shoba (2013): The achievement goal orientation of poor-performing grade 12 Physical Sciences learners
- Beauty Moleki (2014): Exploring teacher use of newspaper articles in promoting a humanistic perspective in science
- Khudakwashe Mamutse (2014): The implementation of inquiry-based science teaching and learning in grade 9 Natural Sciences through the use of improvised physical resources
- Tarisai Chanetsa (2015): An analysis of grade 9 Natural Sciences textbooks for the nature of science
- Summaya Moosa (2015): Misconceptions held by grade 10 learners at three under-performing Dinaledi Schools in Soweto with specific reference to electric circuits
- Surainda Philander (2015): The analysis of Intermediate Phase Natural Sciences workbooks in promoting the nature of science
- Patricia Chisveto (2015): Exploring the influence of school management on “achievement goal orientation” of Grade 10 Physical Sciences learners
- Augustine Nceba Makhubalo (2016): The empowerment evaluation of a grade 11 Physical Sciences teacher in shifting towards an inquiry-based pedagogy
- Zandile Sondezi (2016): A design-based study on the use of problem-based learning in teaching Grade 6 Natural Sciences learners on environmental issues
- Kenneth Buthelezi (2016): A design-based study on the teacher use of Physics Education Technology (PhET) computer simulations in Grade 8 Natural Sciences
- Gwebu Mkhubo Isaac (2016): The nature of science understanding of Physical Sciences teachers from the Badplaas circuit of the Mpumalanga province
- Manzini Samson Hlatshwayo (2016): Investigating grade 10 Physical Sciences teachers’ beliefs and attitude about inquiry-based teaching and learning
- Absalom Lukhele (2016): Assessing the understanding of scientific inquiry of grades 8 and 9 Natural Sciences teachers in the Eersthoek district of the Mpumalanga province.
- Mafor Penn (2019): Grade 12 Physical and Life Sciences Llearners’ understanding about scientific inquiry.
- Emma Ndumanya (2019). An analysis of grade 12 Physical Sciences textbooks for inclusion of “practices” of inquiry-based learning.
- Tomas Shivolo (2019). Teachers’ pedagogical orientations in teaching Grade 8 Chemistry practical demonstrations: A focus on Oshikoto Region, Namibia.

EXTERNAL EXAMINER

PhD theses

- SL Leonard: Scientific literacy and sustainable development: Developing scientific literacy in its fundamental and derived senses (Nelson Mandela Metropolitan University)
- MM Woldeamanuel: Diagnosis of learning difficulties in key chemical concepts in thermodynamics experienced by undergraduate students in Ethiopia (University of South Africa)
- P Preethlall: The relationship between Life Sciences teachers’ knowledge and beliefs about Science Education and the teaching and learning of investigative practical work (University of KwaZulu-Natal)
- SM Mpho Mosabala: The teaching of Doppler Effect in selected South African schools (Tshwane University of Technology)
- M Lycoudi: A content representation of electromagnetism in South African upper secondary school textbooks (University of Witwatersrand)
- WL Teffo: Educators’ classroom practices in facilitating scientific investigations (University of Limpopo)
- M Mukwambo: Exploring situated cognition in teaching science concepts: The nexus of indigenous knowledge and Western modern science (Rhodes University)

- Tamirirofa Chirikure: Exploring students' approaches to Science investigation in Advanced level chemistry (UKZN)
- KB Nhlengethwa: Swaziland Pre-Service Teachers' understanding and enactment of Inquiry-Based-Science Teaching: A Case of a University in Swaziland (UKZN)
- S Akinyemi: Exploring the Development of Pre-service Teachers' Topic Specific PCK and its Influence on Learner Outcomes (WITS)
- DD Denuga: An intervention on supporting teachers' understanding of and mediation of learning of stoichiometry in selected schools in the Zambezi Region

Masters dissertations

- Julia Beauchamp: A case study of South Africa's teachers' understandings of the nature of science and classroom instruction practices (University of Witwatersrand)
- Hlaela Mohloua: Exploring PCK in the process of teaching radioactivity: Strategies employed by Lesotho physics teachers (University of Witwatersrand)
- Kedibone Tlala: The effect of predict-observe-explain strategy on learner's misconceptions about dissolved salts (University of Limpopo)
- Sure Mupezeni: Challenges and prospects of teaching the Doppler Effect at grade 12 (University of South Africa)
- Robert Solomon: The effectiveness of an outreach intervention to provide teachers with the skills to implement practical and experimental work in their classes (Cape Peninsula University of Technology)
- Edwina Mettler: Science teachers' experience of the transition process from General Education and Training to Further Education and Training: A multiple case study Stellenbosch University)
- Aron Singh: Factors that influence the use of practical work in the Grade 10 Physical Sciences classroom (University of Witwatersrand)
- Tizana Fikeni: An exploration of how teachers' understanding of the nature of science influences their pedagogical practices of teaching evolution (University of KwaZulu-Natal)
- RD Makoni: The use of low cost material in the teaching of water purification at the grade 11 (University of South Africa)
- TA Habteselassie: Exploring inquiry based science education at secondary school level in a South African city (University of Pretoria)
- VM Baloyi: Influence of guided inquiry-based laboratory activities on outcomes achieved in first-year physics (University of Pretoria)
- B. Musekiwa: An investigation into how participation in science expos influences grade 9 learners' dispositions towards science learning (Rhodes University)

CRITICAL READER

- W Dudu: Grade 11 teachers' and learners' conceptions of scientific inquiry in relation to instructional practices (University of Witwatersrand)
- RRammiki: Exploring exemplary teachers' instructional practices in supporting learner access to school physics content (University of Witwatersrand)
- P Pitjeng: Investigating the effect of an intervention on novice science teachers' topic specific pedagogical content knowledge (University of Witwatersrand)
- S Akinyemi Exploring the development of preservice teachers' topic specific PCK and its influence on learner outcomes (University of Witwatersrand)

EDITOR RESPONSIBILITIES

- Associate Editor: Research in Science Education (RISE)
- Member of Editorial Board: Journal of Research in Science Teaching (JRST)
- Associate Editor: Education as Change (EaC)

REVIEWER OF JOURNAL ARTICLES

- Science Education
- Journal of Research in Science Teaching
- Research in Science Education
- Teaching and Teacher Education
- International Journal of Science Education
- African Journal of Research in Mathematics, Science and Technology Education
- South African Journal of Education
- Perspectives in Education
- Education as Change
- Pythagoras

PROFESSIONAL ORGANIZATIONS

- Member of research committee of National Association of Research in Science Teaching (NARST)
Member of National Association of Research in Science Teaching (NARST)
- Member of the European Science Education Research Association (ESERA)
- Member of the Australian Science Education Research Association (ASERA)
- Served as an executive member of the Association of Mathematics Educators of South Africa (AMESA) in KwaZulu-Natal
- Member of the Southern African Association for Research in Science, Mathematics and Technology Education (SAARMSTE)

OTHER PROFESSIONAL ACTIVITIES AND ACHIEVEMENT

- Member of University of Johannesburg Faculty Higher Degrees committee
- Member of Faculty Ethics committee
- Member of University of Johannesburg Senate committee
- Member of University of Johannesburg Academic Freedom committee
- Invited keynote speaker at Gauteng Department of Education seminar for physical sciences and mathematics teachers: Enhancing the quality of practical work (2013)
- Invited by Prof Fouad Abd-El-Khalick to speak at colloquium at University of Illinois at Urbana-Champaign.
- Research work for Umalusi on the analysis of intermediate phase CAPS and NCS documents
- Organizing of the seminar series "Continuing the Dialogue: Indigenising the Curriculum".
- Keynote Address at University of South Africa's (UNISA) Research and Innovation Day hosted by the College of Agriculture and Environmental Sciences: Challenges and opportunities for science inquiry-based learning in open distance learning (2018)
- Keynote address at the 28th Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE) conference: Opportunities and challenges for science practical work in African schools (2020)

- Facilitated workshop at 28th Southern African Association for Research in Mathematics, Science and Technology Education (SAARMSTE) conference: Developing formative assessment methods for inquiry teaching (2020)
- Organiser of University of Johannesburg Science Education Student Research (SESRC) conference

SCHOLARSHIPS and AWARDS

- Awarded NRF scholarship for PhD studies (2007)
- Awarded NRF-NSF scholarship for visit to USA (2007)
- Awarded Spencer Foundation Scholarship (2006)
- Awarded Spencer best paper at International Science Education Conference (ISEC) in Singapore (2014) for “A study on the science content storyline of South African chemistry lessons. Paper presented at the ISEC conference in Singapore.”
- Awarded best paper at International Science Education and Teaching Conference (ISET) in Thailand (2015) for “Exploring the influence of school management on the achievement goal orientation of grade 10 South African Physical Sciences learners at township schools.”
- South African National Research Foundation (NRF) rated researcher

COMMUNITY ENGAGEMENT

- Served as a member of the Faculty Community Engagement committee. I have contributed to the professional development of teachers through workshops and in providing professional support to teachers.
- Was as a volunteer worker for the Chatsworth Child and Family Welfare in Durban.
- Collaborated with the Science Centre on Soweto campus in offering extra lessons to disadvantaged physical sciences learners from township schools.
- Coordinated Short Learning Programmes funded by ETDP-SETA
- Facilitated a Memorandum of Agreement between UJ and Delta Environmental Centre. The agreement provides for cooperation on activities that relate to the Department of Environmental Affairs Youth Environmental Services (YES) Programme in Gauteng. I am coordinating these activities.

INTERNATIONAL COLLABORATION

- Working with Dr David Schuster from the Physics Department and Mallinson Institute for Science Education, Western Michigan University on the pedagogical orientation of South Africa Physical Sciences students.
- Working with Dr David Fortus from the Department of Science Teaching, Weizmann Institute of Science, Rehovot, Israel on the achievement goal orientation of South Africa Physical Sciences students.
- Working with Prof Fouad Abd-El Khalick Department of Curriculum & Instruction, University of Illinois at Urbana-Champaign on the analysis of school science textbooks for the nature of science representation.
- Working with Dr Sami Lehesvouri from the Department of Teacher Education, Faculty of Education of the University of Jyväskylä, Finland on visualizing communication structures in science classrooms.
- Working with Prof Dorothy Nampota from the University of Malawi on a comparative study on the pedagogical orientation of Physical Sciences teachers.
- Working with Prof Hsin-Kai Wu and Prof Ying-Shao Hsu from Graduate Institute of Science Education at National Taiwan Normal University on the effective implementation

- of ICTs for science learning, and promoting science teachers' technological pedagogical content knowledge (TPACK).
- Working with Prof Aikling Tan from the National Institute of Education, Nanyang Technological University, Singapore on a comparative study on the analysis of school science textbooks for the representation of the nature of science.
 - Working with Prof Yiyu Cai from the School of Mechanical & Aerospace Engineering Nanyang Technological University, Singapore on the affordances of virtual and augmented reality (VAR) in science learning.
 - Working with Prof Norman Lederman and Prof Judith Lederman on the views of scientific inquiry of grade 12 learners.
 - Working with Dr Yi-Fen Yeh from National Taiwan Normal University on teacher development in understanding the nature of science
 - Working with Dr Garima Bansal from the University of New Delhi on formative assessment in inquiry-based science education

INVOLVEMENT IN SCHOOL WORK ENVIRONMENT

- Chief organiser of Annual Science Expo in Chatsworth
- Chief coordinator of Inter-school Science Project competition
- Judge leader at FFS Science Expo
- Coordinator of extension classes for Matric learners: Chatsworth Teachers' Centre
- Coordinator of student teacher programme: Westville Boys' High school