The Initial Teacher Education Research Project

An examination of aspects of initial teacher education curricula at five higher education institutions

Summary Report

Nick Taylor

August 2014

Citation:

Taylor, N. (2014*). Initial Teacher Education Research Project: An examination of aspects of initial teacher education curricula at five higher education institutions. Summary Report.* Johannesburg: JET Education Services.

Contents

List of Tables

List of Figures

List of Acronyms

AL	Academic Literacy
BEd	Bachelor of Education
CHE	Council on Higher Education
DBE	Department of Basic Education
DHET	Department of Higher Education and Training
EDF	Education Deans' Forum
FP	Foundation Phase – Grades 1-3
HEI	Higher education institution
HESA	Higher Education South Africa
INSET	In-service education and training
IP	Intermediate Phase – Grades 4-6
ITE	Initial teacher education
ITERP	Initial Teacher Education Research Project
JET	JET Education Services
MRTEQ	Minimum Requirements for Teacher Education Qualifications
NQT	Newly qualified teacher
PCK	Pedagogical content knowledge
PGCE	Post-graduate certificate in education
SACE	South African Council for Educators

1 Introduction

Many problems beset the South African school system, including, in many instances, poor management and leadership and the inefficient distribution of resources. But, even where institutions are well managed and teachers have access to sufficient resources, the quality of teaching and learning cannot rise above the ceiling imposed by low teacher capacity. This ceiling may be high in a minority of schools, but in the large majority teaching is often ineffective and learners fall progressively behind the expectations of the curriculum with each passing year.

While there are undisciplined teachers who don't make the best use of time, the majority are doing the best they can and would dearly love to be more effective. The cause of poor performance, by and large, lies not with teachers but with the teacher education system that produced them. While there were a number of excellent teacher education and training colleges during the apartheid years, recognition of the generally poor state of the sector, together with declining student numbers after 1994, led to its radical reorganisation in 2000. This entailed closing most colleges, merging the remainder with higher education institutions (HEIs), and making initial teacher education (ITE) the responsibility of HEIs.

The question now arises as to what extent the current system of teacher education is meeting the demands of South African schools. Are we producing teachers better able to address the challenges of schooling? The purpose of the Initial Teacher Education Research Project (ITERP) is to investigate these questions.

A founding assumption of the project is that norms set by regulatory bodies such as DHET, CHE/HEQC and SACE can, at best, provide a broad framework of formal criteria (number of hours, knowledge fields to be addressed, mix of modules, etc.) but they can neither specify content nor guarantee quality. The quality of professional standards is best evaluated by experts in the profession, and therefore attempts to improve the quality of teacher education must start within the field itself. From this perspective, the research findings outlined below are intended to inform the debate about the quality of ITE, commencing within the terrain of initial teacher education, and in particular among campus-based practitioners.

Evidence has accumulated over the last two decades to suggest that in-service interventions have had limited impact. This understanding, in turn, has led to a growing realisation that the greatest opportunity for improving the quality of schooling lies in strengthening initial teacher education.

The project is an initiative of JET Education Services (JET), in collaboration with the Education Deans' Forum (EDF), the Department of Higher Education and Training (DHET), and the Department of Basic Education (DBE).

2 Conditions in schools

A number of research programmes, of both large and small scale, have described the following conditions as endemic in schools across the country:

1. Low levels of English proficiency among both teachers and learners. This places a fundamental limit on academic progress, since English is the medium of teaching and learning in around 90% of schools.

2. Lack of adequate reading pedagogies, resulting in large numbers of learners reaching Grade 5 essentially illiterate.

3. Lack of adequate pedagogies for basic numeracy, resulting in learners up to and beyond Grade 7 using 'stick counting' methods to perform relatively complex arithmetic operations.

4. Low levels of subject knowledge among teachers.

5. The tendency for schools not to recruit and deploy primary school teachers according to subject specialisation, but to assume that all qualified educators are capable of teaching all subjects. Thus, at some stage of their careers, most primary school teachers will be required to teach maths and English. Across all phases, there are too many teachers teaching subjects in which they did not specialise (DBE/DHET 2011: 34-36, 40-42).

In-service education and training has proved to be singularly ineffective in addressing these problems, despite many millions being spent on this area over the last three decades.

3 Research Design

The Initial Teacher Education Research Project is framed by four main questions:

Research question 1: What range of practices exists in the ITE programmes offered by HEIs to prepare teachers to teach in South African schools?

Research question 2: To what extent do these practices adequately prepare teachers to teach in South African schools?

Research question 3: How do teachers who qualified from different institutions navigate the challenges they encounter in their first years of teaching?

Research question 4: How can the quality of the curricula offered by ITE programmes be improved?

The project is structured around four components. These are designed to complement each other in providing a three-dimensional view of ITE. The components are:

Component 1: A review of the overall coherence and conceptions of teaching which underlie the ITE programmes and curricula in use at five HEIs. This was followed by a detailed examination of the intended and assessed curricula for mathematics and English for teachers specialising in the Intermediate Phase (Grades 4-6).

Component 2: Case studies of a group of students as they move from being students on the five HEIs, through their first two years of teaching. This component will include an exploration of the attained curriculum, i.e. what newly qualified teachers (NQTs) actually know.

Component 3: A large-scale survey across all 23 HEIs of ITE students in their final year of study (4th year BEd, and PGCE), and subsequently tracking their progress over two post-graduate years.

Component 4: Recommendations for ITE curricula for teachers specialising in the IP.

The rollout of the four components is summarised in Table 1.

Table 1: Deliverables for four project components

Project Component		Deliverable
Description	**Time**	
Content of teacher education programmes at 5 HEIs	June 2012 – July 2014	General description and analysis of BEd and PGCE programmes, including teacher educator conceptualisations of teacher professional identity, programme structure and purpose, admission criteria, curriculum contents and coherence, structure and function of teaching practice, and forms of assessment. Comparative analysis of form and content of teaching practice instruments. Description and comparative analysis of BEd IP maths and English courses.
Case studies of NQTs in first two years of teaching	Jan 2014 – July 2015	Report 1: Subject knowledge of NQTs in IP maths and English. Report 2: Progress of the NQTs in adapting to school life; analysis of the extent to which their training facilitated this process.
	Jan 2015 – July 2016	Report 2: progress of the NQTs in adapting to school life; an analysis of the extent to which their training facilitated this process; changes over the course of the second year.

Project Component		Deliverable
Description	**Time**	**Deliverable**
Survey of all final year (BEd and PGCE) students in 2013, tracking them into the workplace for 2 years	June 2013 – July 2014	Report 1: final year students' educational backgrounds, motivations for becoming teachers, perceptions of teacher education programmes, confidence in readiness to teach, teaching practice experiences, and career plans.
	June 2014 – July 2015	Report 2: distribution of NQTs; progress of the NQTs who are employed in SA in adapting to school life; analysis of the extent to which their training facilitated this process; changes in relation to 2013 survey.
	June 2015 – July 2016	Report 3: further progress of the NQTs in adapting to school life; analysis of the extent to which their training facilitated this process; changes over the course of the second year and in relation to 2013 survey.
Recommen-dations for ITE in the IP.	July 2014 – August 2016	Discussion of ITERP findings by teacher educators, government, statutory bodies, teacher unions, donors. Recommendations for Education Faculties, Teacher Educators, Schools, Unions, Government, Donors.

The present report describes progress on Component 1, and the other three components are not mentioned any further below.

4 Research Method for Component 1

Five institutions were invited to participate in the study. Their selection was based on five criteria: institutional history, demography, location, programme delivery mode, and the number of graduates produced annually. Collectively, these five HEIs represent the major institutional types which deliver ITE, and in 2012 produced 49% of all BEd graduates in the country and 61% of PGCE graduates (DHET, 2013).

Ethical clearance for the comparative study was obtained from the DHET and from each participating institution. The first draft of the current report was presented to each of the five institutions for correction on matters of fact and comment on questions of interpretation, and the relevant reports amended where appropriate.

The first step in describing the intended and assessed curricula was to undertake a broad overview of all BEd and PGCE courses offered by these five HEIs. The data collected during this phase, as well as during the second phase described below, related to curricula in use in 2012.

Since then most HEIs have been redesigning their curricula in accordance with the Minimum Requirements for Teacher Education Qualifications (MRTEQ) promulgated by the Minister of Higher Education and Training in 2011 (DHET, 2011). A senior researcher spent two to three days interviewing faculty members and collecting documents, including course outlines and curricula, course notes and reference lists, and assessment tasks. Information was collected on staffing levels and responsibilities, student numbers in the various courses offered, course components, entrance criteria and the type of teacher the institution is trying to develop. The results, across the 5 HEIs visited, are summarised in section 5 below.

The second step was to look in more detail at course content. In order to render this task manageable, it was decided to focus on the curricula for English and mathematics offered to BEd students specialising in the IP. This involved a further round of fieldwork, interviewing the relevant staff and collecting documents. The instruments used to assess student teachers during their teaching practice were also collected. The results of this exercise and subsequent analysis are summarised in sections 6-8.

5 Key findings from an overview of the five case study campuses

Generally speaking, all initial teacher education programmes at the five case study universities aspire to produce knowing, caring and committed 'reflective practitioners'. Strong subject content knowledge is central to this conception of teacher identity, accompanied by a nurturing attitude and ethical behaviour.

BEd curricula are organised around at least three years of subject content and methodology modules, accompanied by a range of general theoretical and pedagogic modules, as well as language, literacy, ICT, curriculum and teaching practice modules. PGCE curricula are largely concentrated versions of BEd curricula, without subject content modules.

However, the content of modules and hence of programmes varies widely among institutions. Teaching practice is the area with the greatest variation, in terms of both quantity and quality: total time students spend in schools varies between 10 and 35 weeks; at all except one institution, teaching practice takes place mostly in suburban schools; diverse experiences are encouraged but not enforced; most supervisors are not subject specialists; and in at least two institutions it is possible for students to pass teaching practice despite performing poorly in a classroom, or even without being assessed on their classroom expertise. We look in more detail at variation in approach to assessing teaching competence within the ITERP in section 6 below.

ITE programmes have low entrance requirements in comparison with most other disciplines. Students are accepted without any reference to what motivates them to become teachers. Teacher educators' low expectations of the academic quality of students (including weak subject content knowledge, lack of proficiency in English, and generally poor reading and writing skills) are not always counterbalanced by any concerted or structured attempt to transform these poor quality entrants into good quality 'reflective practitioners'. In some institutions, the focus appears to be on quantity (more teachers) rather than quality (better teachers).

Most programmes seem to lack a strong underlying logic and coherence. At one institution, curricula change more in response to changing government policies than in response to research-informed opinions or professional judgements. At others, a similar degree of bureaucratic compliance is coupled with an overemphasis on practice (how) at the expense of theory (why), exacerbated by a lack of staff collaboration and module integration.

However, two institutions' programmes display more structural and conceptual coherence than most: they emphasise the development of deep subject and pedagogical content knowledge, together with strong awareness of the theoretical principles and purposes of education. The basis for this coherence appears to be a clear intra- and inter-programme set of beliefs about initial teacher education, grounded in respected theoretical models and shared by the majority of staff.

Much work remains to be done to mine the wealth of data collected for this Overview Report, including an analysis of variations in how the five HEIs view and use Educational Theory and Professional Studies to shape and direct their programmes. In the meantime, we focus below on the details of the instruments used to assess teaching practice, and the maths and English programmes.

6 Key findings from the analysis of the Teaching Practice Instruments

See Rusznyak and Bertram (2014) for details.

Teaching Practice (TP) assessment instruments are a small part of initial teacher education programmes, but they are nevertheless influential in transmitting messages to students, mentor teachers and university lecturers about what constitutes competence in student teaching and as a newly qualified teacher.

Analysis of criteria specified in TP assessment rubrics

Without exception, all TP assessment instruments included reference to students' subject /content knowledge; teaching and learning strategies; learning and teaching support materials; assessment; language and communication; consideration of learner diversity; professionalism and relationship with learners. However, there exist significant differences in how each criterion presents teaching, and what is expected of students in relation to each one.

Content knowledge
In two institutions, students' understanding of content knowledge is depicted as essential for effective teaching, whereas within others, a sound grasp of content knowledge is only one of many criteria that contribute a portion to an overall credit.

Pedagogic Knowledge
Criteria (and in one case level descriptors) can be distinguished according to whether they present teaching as a collection of technical presentation skills, a generic practice (with reference to general pedagogic knowledge) or a specialised practice (with reference to

Pedagogic Content Knowledge, PCK). Four of the five instruments analysed contained criteria that referred mostly to students' presentation skills and their ability to draw on a general pedagogic knowledge base. The level descriptors of one instrument described what students' teaching competence would look like if informed by a consideration of PCK.

Situational / Contextual Knowledge
The analysis found very little provision for recognising the way in which student teachers respond to the limitations, challenges and opportunities within the context of their school placement.

Conceptions of professionalism
The three ways in which conceptions of teacher professionalism are typically conveyed through TP assessment instruments are through interpersonal relationships within a school setting, students' appearance, and their ability to make considered and reasoned pedagogic judgements in relation to specialist knowledge. There tended to be a greater emphasis on interpersonal relationships and appearance in four of the institutions.

Structure of TP assessment instruments
In analysing the structure of the TP assessment instruments, how they portray the respective roles of the mentor teacher and university lecturer, how the rating scale or level descriptors signify what constitutes distinctive or unacceptable levels of teaching competence, and the mechanism by means of which a pass/fail results decision is reached were considered.

Who assesses what?
Some institutions require that university staff members and school based teachers should seek consensus, and bring their particular perspectives together to enhance the overall assessment. Others require that school-based teachers assess students' extra mural involvement, inter-personal relationships, and general professionalism, while university tutors assess the extent to which students draw on university coursework to inform pedagogic decision making. In this way, assessment of the substance of student teaching is determined by the structural arrangement of who assesses what.

The use of explicit or implicit rating scales and level descriptors
In four of the institutions, students are assessed on a four or five point rating scale. While the use of a checklist of criteria along with a simple rating scale may seem like a user-friendly way to structure the assessment of student teaching, it relies on a wide range of assessors (all supervising teachers and a large number of university tutors) being able to interpret each criterion at different levels of competence.

One university provides explicit descriptors to define what constitutes each level of competence against every criterion. The TP assessment instruments enables student teachers to access what they are doing, what they're not doing, and what they should be doing in order to teach more effectively. It also provides more guidance to assessors in unpacking what constitutes competent teaching at each level and against each criterion.

The atomistic or holistic assessment of student teaching

When the overall mark awarded to the student is an arithmetic sum of ratings against a list of criteria, a notion that teaching is reducible to a collection of skills is transmitted. In contrast, a conception of teaching that involves both cognitive and performance dimensions is conveyed by an assessment rubric that plots a student teacher's level of knowledge, understanding and thinking against the effectiveness of her classroom performance.

Conceptions of teaching conveyed in TP assessment rubrics

The study considered how combinations of design features work collectively to convey particular conceptions of teaching. While the three categories described in the bullets below are idealised abstractions, they are useful in gauging the extent to which the design features in TP assessment rubrics convey particular conceptions of teaching:

- When teaching is understood as a *skills-based endeavour*, the routines, procedures and skills needed for managing a classroom are emphasised in TP assessment instruments. Atomistic criteria are generally listed as an end in themselves. Teachers' dispositions and what they can do count more than students' understanding of a principled body of knowledge and its application for sound judgments.

- Teaching as a *generic applied science* draws on general pedagogic knowledge to inform classroom practice, drawing attention to a strong teaching and learning imperative. The teacher's understanding of content knowledge is not portrayed as a precondition for effective teaching, but is one of numerous considerations.

- A conception of teaching as a *complex and specialised practice* is conveyed by the use of a network of criteria that reveal the relationship between appropriate pedagogic choices, the content to be taught and the learning needs of those to be taught. Students' understanding of the content knowledge is a non-negotiable condition for effective teaching both as a condition for enabling access to conceptual knowledge, and as the grounds upon which pedagogical choices can be justified.

In general, the TP assessment rubric from one institution tended more towards portraying a conception of teaching as a complex and specialised practice, while the other four tended to portray teaching more as a generic practice. If university-based coursework presents teaching as an integrated, complex practice but student teaching is assessed as a collection of discrete skills or against generic competencies, then coherence within the teacher education programme is unduly compromised. The use of assessment rubrics that do not adequately support student teacher professional development in planning conceptually strong and well executed lessons not only misses an opportunity to support students' professional development, it may also perpetuate the prevalence of technicist guidance provided to them during their practicum sessions.

7 Key findings from the Report on English courses for BEd IP teachers

See Reed (2014) for details.

English courses offered

English courses offered to prospective IP teachers on the five case study campuses are described in terms of three kinds of knowledge (Banks, Leach & Moon, 1999). First, Subject Knowledge English consists essentially of literature, media studies, and language/linguistics. School Knowledge is the knowledge and skills specified in the particular curriculum to be followed in schools, and Pedagogic Knowledge includes knowledge of approaches to teaching a language, and strategies for teaching speaking, listening, reading, and writing. The latter two components are often difficult to distinguish, and in what follows we group them together. Interviewees at all five HEIs mentioned the low levels of English proficiency and of academic writing ability exhibited by many students, and for this reason all offer some support for academic reading and writing, which we describe below as Academic Literacy (AL).

Table 2 summarises the courses offered by the five institutions (labelled A-E) to students specialising as English teachers, in terms of these knowledge components.

Table 2: English Courses for IP BEd English specialists

	A	B	C	D	E
Academic Literacy	1 year course: New Lits for Teachers	2 semesters: Academic and Computer Literacy	No AL, but some attention to it in Level 2 Eng modules	2 semesters: Academic Literacy	2 year long courses: Academic Literacy
Subject Knowledge	4 year courses: Eng Lang and Lit	6 semesters: Eng Lang and Lit 1 - 3	5 semesters: Eng Lang and Lit	6 semesters: Eng Lang and Lit	4 year-long courses: Eng Lang and Lit
School and Pedagogic Knowledge	2 year courses: Language Method 1 and 2	2 semesters: Eng as Medium of Instruction. 4 semesters: Eng Method	2 semesters: Language Method (one semester each for HL and FAL)	2 semesters: English Method (FAL)	HL: 4 year-long courses: Eng Method

Aside from the fact that all five HEIs offer some or other form of Academic Literacy, the most striking feature of Table 2 is the variation in both duration and content of the other components. Thus, Institutions A and E both offer 4 full years of Subject Knowledge, while Institution C offers only 5 semesters. Regarding School and Pedagogic Knowledge, Institution E provides specialist

English teachers with 4 year-long courses, while the other 4 HEIs offer only between 2 and 4 semesters. Table 3 summarises the English courses for BEd IP teachers who do not specialise in English. It is disturbing to note that, despite the ubiquitous complaint that many students enter university with weak English proficiency, and despite the fact that the overwhelming majority of IP teachers will teach through the medium of English, three of the HEIs in the ITERP sample (A, B and D) provide no Subject Knowledge English for students not specialising in this subject, while Institution D offers no School or Pedagogic Knowledge in English either.

Table 3: English courses for IP teachers not specialising in English

	A	B	C	D	E
Academic Literacy	1 year course: New Literacies for Teachers	2 semesters: Academic & Comp Lit: 1 for all students + 1 for weak readers	No Academic Literacy courses	2 semesters: Academic Literacy	2 year courses: Academic Literacy
Subject Knowledge	None	None	2 semesters: One for Eng Lang; one for Eng Lit	None	HL 2 year courses: Eng Lang & Lit. FAL 2 year courses: Eng Lang & Lit (non-credit, elective).
School and Pedagogic Knowledge	1 year course: Language Method	2 semesters: English as LOLT (FAL)	2 semesters: English Method HL and FAL	None	HL 2 year courses: Eng Method. FAL 2 year courses: Eng Method (non-credit, elective).

Table 4 summarises the number of credits carried by the courses listed in Table 2 and Table 3. Here too the variation across HEIs is striking, with English courses for specialist English teachers constituting only 15% of the overall degree at Institution C, while the comparable figure for Institution B is 34%.

With respect to those IP teachers who have elected not to specialise in English, the question must again be asked whether their formal exposure to English Subject and Pedagogic Knowledge (between 5% and 7.5%) is adequate.

Table 4: Proportion of BEd degree made up by English courses for IP teachers

Elective	A	B	C	D	E
IP English Specialists	120 (25%)	162 (34%)	72 (15%)	120 (25%)	HL: 72 (15%) AL: 5 (1%)
IP English Generalists	30 (6%)	28 (6%)	36 (7.5%)	24 (5%)	HL: 28 (6%) FAL: 29 (6%) AL: 5 (1%)

Observations

The full Report on English courses offered to IP teachers at the five case study campuses provides a rich source of information and analysis, and in the space available below we can do little more than allude to some of the most important issues.

English for academic purposes

The academic literacy courses offered to all IP student teachers at each of the five institutions in the study contribute to very different constructions of literate teachers, as a result of the different learning focus of each course. Some aim to fill gaps in student teachers' syntactic and lexical knowledge of English; others aim to support development of the ability to read and write academic texts and to undertake research. While the need for 'gap filling' for some students is acknowledged, if this is the sole or main focus of academic literacy programmes student teachers are unlikely to gain sufficient epistemic access to 'socially powerful' theoretical knowledge (Shay, 2012).

New literacies for teachers

Only two institutions offer courses (both subject and pedagogic in one institution and pedagogic in the other) that enable students to engage substantively with New Literacy Studies in which literacy practices are considered 'cross culturally, in different domains, in different discourses and as they vary in relation to different sign systems and different technologies' (Janks, 2010, p. 117). When literacies are produced and used in such diverse ways within and across communities in South Africa and globally, this lack of engagement with new literacies in several institutions is a cause for concern.

English as subject specialisation / English as subject for the 'non-specialist'

The subject courses offered to IP English specialists at each of the five institutions contribute to very different constructions of teachers of English, as a result of the breadth and depth of study (more courses at more levels offered in some institutions than others), differences in content foci (at two extremes, mainly canonical literature on the one hand and mainly descriptive grammar on the other) and the texts (including film texts) and genres chosen by lecturers. Literature for children and adolescents, as part of the subject knowledge of an IP English teacher, is backgrounded or ignored at several institutions and is a cause for concern given the importance of developing learners' interest in reading and the contribution of reading to lexical and syntactic knowledge.

The opportunities for IP student teachers not specialising in English to study English as subject courses, which could contribute to their development as literate teachers, vary from non-existent (at institutions A, B and D) to limited (institution C) to more adequate (institution E).

Learning to teach English as home or additional language; learning to use English as LoLT

Even in the two institutions which offer more School and Pedagogic Knowledge courses than do the other three, the allocation of time and course credits is significantly less than for English as Subject for IP English specialists. While depth of Subject Knowledge is centrally important in teacher education, it appears that across all five institutions, there may be insufficient focus on equipping student teachers to guide IP learners to become proficient readers and writers / producers of texts in a range of genres and modes. In particular, little or no attention is given to reading pedagogies across the sample, a skill which is in dire need in the school system, as described in section 2 above.

In only two of the five institutions is substantial time allocated to microteaching and lesson planning. These two institutions are also the only ones that foreground the CAPS documents in their School and Pedagogic Knowledge courses and that teach IP specialists on their own for a one year course.

The opportunities for IP generalists to study courses with a focus on School and Pedagogic Knowledge vary from non-existent (at university D) to limited (at universities A, B and C) to adequate (university D).

The language and literacy challenges experienced by many learners in the transition from learning in their home languages(s) to learning in English and in developing their knowledge of English as subject, together with the challenges associated with the linguistic complexity of classrooms in many urban areas, appear to be insufficiently addressed across all institutions, although some pay more attention to addressing these challenges than others.

Capacity

The resources, particularly human resources, available at the five institutions appear to differ markedly to the detriment of what some institutions (particularly universities C & D) are able to offer to students in terms of formative feedback on their work, opportunities for microteaching and opportunities for lecturer modelling of good teaching practices for the classroom.

Curriculum coherence

At some institutions interviews with lecturers revealed lack of familiarity with what is offered to IP English specialists, in both subject and pedagogic knowledge courses, across the four years of a BEd curriculum. This is a cause for concern in regard to curriculum development and curriculum coherence.

Concluding observations in relation to government policy

(i) MRTEQ specifies that all new teachers should be proficient in the use of at least one official language as a language of learning and teaching (LOLT). For the IP, this is likely to be English (as a home or additional language) for the majority of the country's learners (with Afrikaans the alternative). This may be one reason why some institutions, particularly university D, but also to a lesser extent universities B and E, foreground the syntax and lexis of English in their academic literacy courses and English as subject courses. A question to be asked is whether student teachers who require courses to build their proficiency in English should be placed on an extended curriculum so that becoming more proficient in English is not at the expense of acquiring the knowledge of English as subject and pedagogic knowledge for teaching English competently.

(ii) MRTEQ specifies that all BEd students are required to develop 'intellectual independence' and 'some level of research competence' in order to provide a basis for postgraduate studies and for further professional development. In the data from the five institutions it is evident that developing independent and critical thought and research competence is addressed at three of them in courses for English specialists in the latter part of the degree (Institutions A, B and E) and from first year in two of them (Institutions A and E). Information from a fourth year Professional Studies course at Institution E indicates that all BEd students undertake a research project and this raises the question of whether 'developing research competence' is located in parts of the BEd programme at institutions C and D for which data were not obtained or whether this specification in the MRTEQ is not addressed at these two institutions. Nevertheless, most BEd and some PGCE programmes at all five institutions include a research module or an independent study, which are not confined to the Intermediate Phase or to maths or English.

(iii) There are three specifications from MRTEQ for *all* IP teachers that appear to be ignored, or inadequately addressed in some or all of the BEd programmes at the five institutions:

- *All IP teachers must be skilled in identifying barriers to learning within their specialisations(s), as well as in curriculum differentiation for multiple learning levels within a grade.* There is no indication in the data analysed that attention is paid to these two aspects of pedagogy at any of the institutions. This may be because these are addressed in a general way in courses such as 'inclusive education' but the neglect of a disciplinary (subject) focus can be questioned.

- *All IP teachers must specialise to teach languages (comprising First Language Teaching in one of the official languages and First Additional English Language teaching).* The first language may be any of the eleven official languages and thus data about this aspect of the BEd curriculum may not have been gathered (from Institution E there is data that all students are required to study three languages – English, Afrikaans and

isiXhosa – for two years). However, it is clear that not all IP teachers *specialise* in teaching English as first additional language at any of the five institutions, with only universities B and C offering a methodology course to all IP BEd students in which the focus is on teaching and learning English as LOLT (university B) or teaching and learning an additional language (Institution C).

- *All IP teachers must have a sufficiently broad background knowledge to understand the requirements of all subjects in the IP curriculum.* Where there are no English as subject courses for all IP students as is the case at universities A, B and D, (though such courses were to be added at Institution B in 2014), or English methodology courses (the situation at Institution D) it is difficult to imagine how student teachers can acquire such knowledge.

8   Key findings from the Report on Mathematics courses for BEd IP teachers

See Bowie (2014) for details.

Maths courses offered

The maths courses offered to prospective IP teachers specialising in mathematics are summarised in Table 5. Three features of Table 5 are noteworthy. First, the numbers specialising in maths are generally small and highly variable, both across institutions and within institutions from one year to the next. Thus, at Institution E, 58 first year students have elected to specialise as maths teachers, while in the fourth year only 8 students have chosen maths as an elective. Second, there is no agreement on the entrance requirements for maths teachers. Institution A demands 65% on a test given to all first year students, Institution B requires students to have obtained a pass at 50% in Mathematics in the NSC exam, while at Institution C students are permitted to specialise as maths teachers if they scored as low as 30% on Maths Literacy in the NSC. Finally, the proportion of the BEd degree taken up by maths courses varies from a low of 13% at Institution E to as much as 25% at Institution B.

Table 5: Maths courses for IP BEd Maths Specialists

HEI	Student numbers (approximate proportion of all IP students)	Entrance Requirements	Maths Credits	Percent total credits
A	15 - 25 (25%)	Must achieve at least 65% in the first year Maths course that is compulsory for all first year students	100	21%
B	60 (33%)	M 50% ML not allowed	128	25%

HEI	Student numbers (approximate proportion of all IP students)	Entrance Requirements	Maths Credits	Percent total credits
C	100-200 (±10%)	Pass (30%) in M or ML	108	23%
D	150 (17%)	M 40% or 50%	120	24%
E	Variable from 58 (52%) in 1st year to 8 (9%) in 4th year	M 40% & test ML 60% & test	64	13%

Maths courses offered to IP teachers not specialising in the subject are shown in Table 6.

Table 6: Maths courses for IP teachers not specialising in Maths

HEI	Approx number of IP students not specialising in maths per year	Maths credits	% of total credits
A	60 - 75	40	8%
B	120	16	3%
C	1600	12	2.5%
D	750	68* (ML)	13%
E	55-80	19	4%

* IP students not specialising in maths did courses in mathematical literacy and mathematical literacy teaching methodology

This table presents another disturbing picture: while most teachers will, at some stage in their careers, be required to teach maths (see point 5 in section 2 above), preparation for this task is woefully inadequate.

Content of courses for teachers specialising in maths

At all the institutions studied, prospective IP mathematics specialists are required to take courses that deal specifically with mathematics content as well as methodology courses which explore the pedagogy associated with teaching IP mathematics. Figure 1 indicates the approximate number of contact periods of these courses at each of the institutions[1], and indicates the nature of the mathematics content of these courses. With regard to the content,

---

[1] In the case of the distance education institution contact hours were estimated as being equivalent to approximately half the allocated hours for the course as most institutions assume approximately equal self-study and contact time.

this does not indicate the level of cognitive challenge posed by the content, merely the level at which the content is generally encountered in the education system. Thus, the content labelled 'Maths IP, SP' consists of counting; the arithmetic operations; fractions, ratio and proportion; and some work on the shape and size of geometric figures.

**Figure 1: Maths courses for BEd students specialising in IP maths**
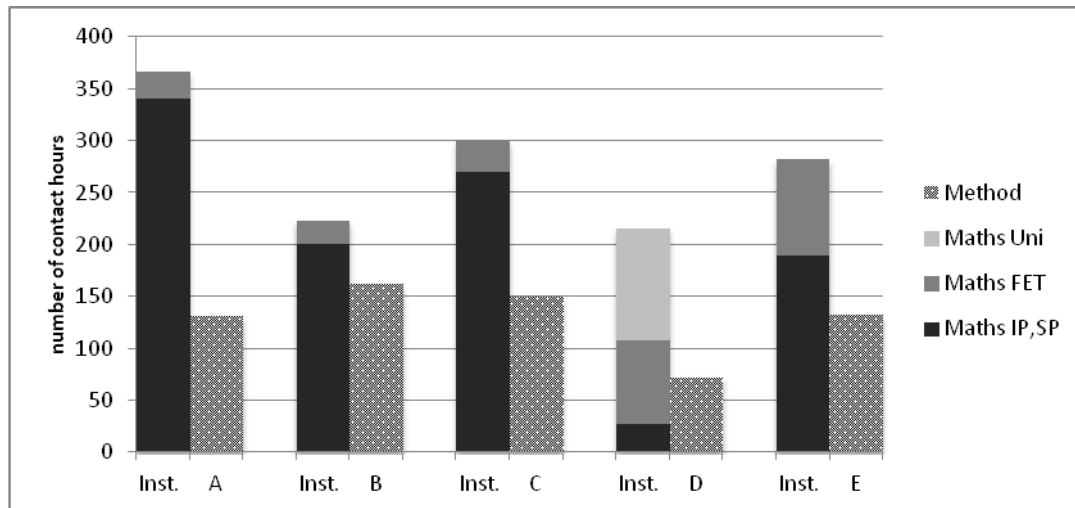
Institutions A, B, C and E focus largely on the mathematical content from the intermediate and senior phase curricula (grades 4 – 9). However in most cases this is done at a greater level of conceptual depth than would be done by learners at school and includes a focus on the specialised knowledge of mathematics that teachers would be likely to need. At institution D, although the focus of the mathematical content is on topics traditionally covered by university students, these tend to be dealt with at a low level of cognitive demand.

There is a large degree of variability in the methodology courses. Although all method courses include reference to mathematical content, work from the field of mathematics education research and the practice of teaching, the degree to which each of these is foregrounded in the courses studied varied.

Content of courses for teachers not specialising in maths

Maths courses provided to students not specialising as maths teachers are shown in Figure 2. The exposure to either mathematics or mathematics methodology courses for these 'non-specialists' is low and varies considerably between institutions. At Institution B, student teachers do not do a methodology course, and the one mathematics course that they do focuses on mathematics for everyday life rather than on the specialized knowledge of mathematics required by teachers. At Institution C, student teachers only have a single methodology course.
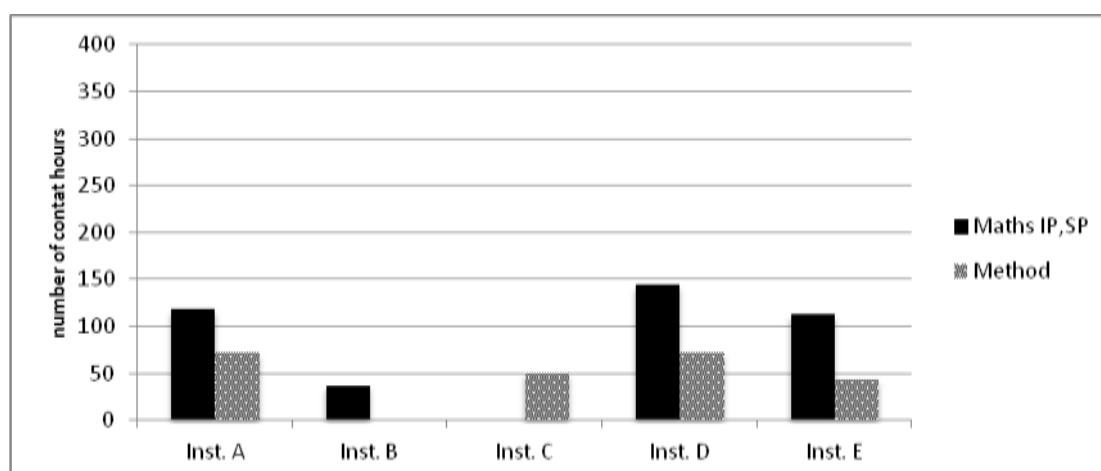
At Institution D, where prospective IP teachers who are not specializing in maths are offered the most contact periods in maths courses, the courses they do are mathematical literacy courses. Although the mathematical content covered in the mathematical literacy course is aligned with IP mathematics the methodology course focuses on the approach to teaching Mathematical Literacy as an FET subject which differs substantially from the approach required to teach Mathematics as an IP subject.

At Institutions D and E where learners do both mathematics and methodology courses, the nature of the mathematics questions is weighted in favour of lower cognitive demand tasks. Many of the lecturers at these institutions commented that a large proportion of the student teachers had an inadequate grounding in the mathematics they would need to teach, thus necessitating a focus on getting the basic mathematics right in both the mathematics and methodology courses.

Concluding comments

The research suggested an emerging commonality in the mathematics content courses for prospective IP mathematics specialists across four of the institutions. These courses deal mostly with mathematical topics taught to IP and SP learners, but work on them at a deeper level and with a focus on specialized mathematical knowledge a teacher would need to know. These courses align well with the codified version of "mathematics for elementary school teachers" exemplified in textbooks of the same name from the USA.

In contrast there is much greater variability in the methodology courses for prospective mathematics specialists as well as in the offerings at all levels for prospective IP teachers who are not specializing in mathematics. There is some concern, given that most IP teachers will end up teaching mathematics at some level, about the depth and breadth of mathematics and methodology courses that are made available to those who are not specializing in mathematics.

9 Conclusion

The purpose of this study is not to evaluate individual institutions, but to describe curricula and practices across the terrain of initial teacher education, with an in-depth focus on the range and depth of maths and English courses provided to BEd students specialising in Intermediate Phase teaching. The insights provided by ITERP, in turn, are intended to contribute to an informed discussion about the design and delivery of ITE curricula most suited to reforming the country's very weak school system.

The IP years (Grades 4-6) are a critically important period, when most pupils move from learning in their mother tongue to using English as medium of instruction, and all must make the transition from arithmetic based on counting to becoming proficient in the more sophisticated tools of mathematics. Currently the majority of learners are at least two years behind curriculum expectations by the time they reach Grade 5, in both language and maths.

The BEd degree forms the bridge between generally poorly prepared matriculants exiting the school system and newly qualified teachers embarking on a career of teaching. University education faculties thus occupy a key node in the system. This is the point that holds the most promise for breaking the cycle of mediocrity which bedevils schooling and exerts a heavy brake on both the personal development of most citizens and the production of knowledge and skills needed for a more vibrant economy.

The findings of the research study described above reveal a very wide variation in all dimensions of the curricula examined. And while there are some excellent practices, it is clear that, as a whole, none of the five institutions studied is rising fully to the challenge posed by the country's low quality school system, particularly with respect to those student teachers not specialising in maths or English.

Regarding mathematics, there is a question as to whether students specialising in the subject are sufficiently equipped to lay the firm foundations in number facility, problem modelling and abstract reasoning required to enter the field of mathematics, science and technology. But, however effective they are as teachers, there are far too few of them to make a significant difference at the system level. Here government can play an important part in attaching conditions to the generous Funza Lushaka bursary programme to ensure a bigger pipeline for maths teachers in the IP, in helping provinces to take up Funza Lushaka graduates and other newly qualified teachers more rapidly, and in holding principals and School Governing Bodies responsible for more effectively utilising teachers and their specialisations. However, in the end, the quality of teachers emerging from the pipeline depends heavily on the quality of their university education. In this regard, the teacher education sector seems to be far from a solution to the problem of poor quality teaching in mathematics.

The situation with respect to the language of teaching and learning, predominantly English, is of particular concern. While the specifications of new MRTEQ regulations are likely to make a difference for the better in mandating more attention to languages, they are unlikely to have a significant effect on the quality of English proficiency among NQTs across the system. Policy is too easily subverted to be of much effect if, at the same time, teacher educators fail to become concerned enough about these problem to give them concerted attention.

This requires a very serious discussion among teacher educators in all sub-disciplines, but particularly in English and mathematics. As a matter of urgency the sector needs to reach a greater degree of convergence concerning the proficiency, in both subject knowledge and pedagogy, required by teachers, the curricula most likely to achieve these standards, and how the outcomes should be assessed.

Acknowledgement

References

Banks, F., Leach, J. & Moon, B. (1999) New Understandings of Teachers' Pedagogic Knowledge. In J. Leach & B. Moon (Eds.) *Learners and Pedagogy*. (pp. 89-110) London: Paul Chapman & The Open University.

Bowie, L. (2014). *Report on mathematics courses for Intermediate Phase student teachers at five universities.* Johannesburg: JET Education Services.

DBE/DHET. (2011). *Integrated Strategic Planning Framework for Teacher Education and Development in South Africa, 2011-2025: Technical Report.* Pretoria: Departments of Basic Education and Higher Education and Training.

DHET. (2011). The Minimum Standards for Teacher Education Qualifications. Government Gazette, Vol. 553, No. 34467. 15 July 2011.

DHET (2013). *Trends in Teacher Education 2012*. Pretoria: Department of Higher Education and Training.

Janks, H. (2010). *Literacy and Power*. New York & London: Routledge.

Reed, Y. (2014). *Report on English courses for Intermediate Phase student teachers at five universities.* Johannesburg: JET Education Services.

Rusznyak, L, and Bertram , C. (2014). *An Analysis of Teaching Practice Assessment Instruments: A cross-institutional case study of five universities in South Africa*. Johannesburg: JET Education Services.

Shay, S. (2013). Conceptualizing curriculum differentiation in higher education: a sociology of knowledge point of view. *British Journal of Sociology of Education*. 34(4): 563-582.