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Reflections on Support Structures Available to First Year Mathematics Students at a University

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ABSTRACT This paper focuses on the support structures offered to first year mathematics students at the University of KwaZulu-Natal (UKZN). The objective was to determine the effectiveness of support structures at UKZN that are intended to help students attain success in their studies by improving communication to students on the requirements for the modules that they are studying. The literature review focused on support structures offered to students at universities in other countries. Data was obtained from the UKZN module websites and responses from academic staff and students It was found that the support structures offered at this university compared favourably with those offered by universities in other countries. The findings indicate that there is a need and scope to improve on the effectiveness of the student support structures that are provided for first year mathematics. These involve policy, administrative and academic issues.

INTRODUCTION

Under preparedness of first year university students registered to study mathematics is a concern at universities in different countries throughout the world. This could be concluded from the study of relevant literature (for example London Mathematical Society, Institute of Mathematics and its Applications and Royal Statistical Society 1995; Sander and Cleary 2004; Gill and O'Donoghue 2007; Steyn and Du Plessis 2007; Jennings 2009; Faulkner 2011; Department of Basic Education 2013; Maharaj and Wagh 2014a; Heydenrych and Case 2015). This *mathematics problem* or *first year experience* as referred to in the literature is compounded by the fact that an ongoing increasing number of students satisfy the initial requirements to register for university mathematics studies. The normally limited resources of a university are strained to provide student support to improve the throughput of such students. The reason for this is that those resources should normally be used to provide support structures for the mathematics content that first year students are expected to study at university level. This is one of the problems with which the School of Mathematics, Statistics and Computer Science (MSCS) at the University of KwaZulu-Natal (UKZN) is faced. Informal discussions and email communications with lecturing and support staff indicated that the feeling was that too much of the resources were and are still spent on providing support to students. This was the motivation to study in general the student support structures and reflect on them in the context of those provided at UKZN with the intention of making them more effective.

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Research Question

The research questions in the context of the support structures at UKZN were: What are the student support structures available to first year mathematics students? How could the structures be improved so that they benefit students more?

Literature Review

The review focuses on support structures that could be provided to students apart from their formal lectures. So the support structures are in the context that is outside the formal lecture setting. The support structures could be planned, in formal settings, compulsory or made use of on a voluntary basis. This section focuses on: Support structures for first year students

in general and specialised support structures for mathematics.

Support Structures for First Year Students in General

Here the discussion focuses on common support structures that are provided by departments of universities. Several studies, documents and policy proposals have focused on student support structures (for example, Gill and O'Donoghue 2007; Complete College America 2012; Ramapela 2012; University College London 2013a, 2013b; Long 2014; Havenga 2015; Layton 2015). At the University College of London (2013a, 2013b) each student has at least two tutors, a personal tutor and a departmental tutor. Personal tutors are academic staff members or appropriate postgraduate students who develop a supportive, non-authoritarian role with a small group of students; they provide opportunities for their students to reflect on, with regard to their future aspirations and the steps they need to take to succeed. They get to know each student very well and the student is expected to consult the personal tutor over any problems that he/she encounters. Departmental tutors are ultimately responsible for the academic progress, general welfare and discipline of all students in their department; generally they are not expected to know their students on an individual basis but to co-ordinate the work of the personal tutor as relevant to their department.

The research report by the Complete College America (2012) noted that stand alone remediation courses that were used in community colleges in 31 participating states did not improve the throughput of students, since in general 70 percent of such students were unsuccessful. That report recommends the integration of remediation into mainstream courses and views remediation as a core requisite course; not as pre-requisite. Long (2014) formulated a proposal for the Harvard Graduate School of Education that discussed possible approaches to re-designing remediation for underprepared students, to improve the throughput rate. The following approaches were identified: *Mainstreaming* – refers to the placing of underprepared students in the mainstream courses and providing additional support (for example special sections and advising apart from tutoring); *Linked remedial and college level courses* – refers to combining of college course work and remedial course in a co-ordinated fashion; *Technology enhanced learning and modularization* – refers to assessments and targeted short tutorials, both online, to provide support.

It is clear from the above that the literature implies that remediation should be integrated with the mainstream courses through appropriate support to facilitate better communication of the requirements for a module. Further, the integrated remediation could be in the form of online support.

Specialised Support Structures for Mathematics

A number of universities in the United Kingdom (UK), Australia and Ireland offer mathematics support to students through specialised mathematics support centres (Gill and O'Donoghue 2007; Mathews et al. 2012). The evaluation of mathematics support centres by Mathews et al. (2012) refer to audits of the provision of mathematics support over a twenty year period offered at institutions in the UK, Australia and Ireland. Among the recommendations made for effective functioning of support centres were deploying adequately qualified staff and access to funding for the provision of effective support. Those researchers also claimed that students who access mathematics' support appear to benefit in terms of achievement and confidence in their studies. Further, it seems that a major problem in the context of the support provided is that those students who most need the support tend not to access it. The paper by Gill and O'Donoghue (2007) reported on and evaluated the usage of support structures and resources offered by the Mathematics Learning Centre (MLC) setup at the University of Limerick, in Ireland. At the MLC the following eight resources and facilities are provided:

- *The Drop-In Centre* where students could go to without appointments for free one-one consultations;
- *Diagnostic Testing* used to identify and inform students who need supplementary help;
- *Support Tutorials* of an hours duration are set up and taught on a weekly basis to small groups of students (about 10) – these are in addition to regular tutorials;

- *Textbooks* refers to the provision of multiple hardcopies of all the required textbooks for the various mathematics courses offered at the university;
- *Computer Assisted Learning (CAL)* - 5 computers are provided for access to CALMAT tutorials;
- *Examination Revision Programmes* focus on the organization of revision programmes for all the main service mathematics courses;
- *Peer Tutoring* refers to a mutual benefit programme that makes use of volunteer student teachers (who have teaching practice throughout their degree programmes) to teach mathematics based on access courses;
- *Online Support* refers to specifically designed support help provided on the MLC website for each service mathematics course offered at the university.

The main findings of the research reported by Gill and O'Donoghue (2007) were: (1) students preferred support that was on a one-to one consultation basis; (2) as measured by the results on the next and subsequent university mathematics examinations there was a distinct, if not decisive, advantage for those students who attend support tutorials over those who do not attend; (3) unfortunately such attendees were in the minority which implied that some action was needed to reach all those who need help but were not making use of the support structures; (4) analysis of the University of Limerick database showed that 78.3 percent of those deemed to be in need of help, failed to attend the support tutorials in the first semesters and 78.5 percent in the second semesters. Although students seem to prefer support on a one-to-one basis from a financial point of view, it is not always possible to provide support that involves personal interaction. This implies that with the increase in student numbers at universities there is a need to invest in online services. To create greater access for students, there is a need to customise these for use outside campus and make availability 24 hours a day.

In the South African context, the paper by Maharaj (2012) focused on the design and implementation of mathematics tutorials over a nine year period at UKZN. That research reflected on four different types of mathematics tutorial designs that were implemented and their effectiveness. The findings indicated that organised tutorials that included a completion of work component were more effective.

Conceptual Framework

The main principles that guided the conceptual framework were:

1. An increasing number of first year university mathematics students are underprepared for their studies. This impacts on the throughput of such students in a negative manner and so there is a need for remediation.
2. It is necessary to integrate diagnostics and remediation for such underprepared students into main stream mathematics courses; as informed by Complete College America (2012) and Long (2014) in the literature review.
3. The study of mathematics is hierarchical in nature. This provides another reason for the provision of diagnostics and remediation.
4. Different modes of support should be available to students; for example face-to-face tutoring, drop-in-facilities for academic help and online support (Gill and O'Donoghue 2007).
5. There is a need to investigate the provision of support structures at UKZN and also how to make the provision more effective.

METHODOLOGY

This was informed by the literature review and conceptual framework. To gather information on the support structures available to first year mathematics students by the school of MSCS at UKZN and to determine how the provision of support to students could be made more effective, the researchers posed these issues to the Academic Development Officer (ADO) of the school via an interview and follow up email communications (Mshengu 2014). The former was to get a feel for some of the support structures and possible problems. The email communication was aimed at obtaining documents that the researchers could analyse. Her email responses referred us to attachments of an organogram on the support structures and her monthly reports for the year 2014. Informal discussions were held with the relevant first year lecturers, first year mathematics students, teaching and learning representatives from the mathematics discipline on each campus (Westville,

Howard College, Pietermaritzburg), and the Dean and Head of the School of MSCS to gather their answers to the research questions. The then acting Academic Leader for Teaching and Learning for the school sent an email indicating his concern with regard to low pass rates in some of the first year core mathematics modules. A number of exchanges took place among the relevant lecturers and that academic leader. Some of the main issues were discussed at the first mathematics discipline meeting of 2014. It emerged that the relatively low pass rates for two mainstream modules were of concern. One was the core mainstream mathematics module *Introduction to Calculus* (Math130) offered to students who wanted to pursue further studies in mathematics on the Westville and Pietermaritzburg campuses. The other was *Mathematics 1A* (Math131) a core module offered to engineering students on the Howard College and Pietermaritzburg campuses. The general perception of the lecturers during informal discussion, at formal meetings and through email exchanges was that a significant number of students who enrolled for those modules were underprepared for their university studies. This perception was supported by the findings of the paper by Maharaj and Wagh (2014b). The research ethical guidelines of UKZN as indicated in Research Policy V (University of Kwa-Zulu Natal 2007) guided this study. Further, the first author successfully completed and was certified by the United States of America's National Institutes of Health (NIH) Office of Extramural Research Web-based training course "Protecting Human Research Participants". The guidelines to conduct research with human participants, as indicated in that course, were also followed in this study. This was the context within which the ethical and consent issues were considered in the gathering of data from the university website and responses of the ADO, lecturers and students.

FINDINGS AND DISCUSSION

These are presented for each of the two research questions.

What are the Student Support Structures Available to First Year Mathematics Students at UKZN?

The findings and reflections according to the feedback received from the different role players are reported under the following sub-headings: Tutorials; Hot-seat tutors; Supplemental Instruction (SI); Online module websites; Online diagnostics for pre-calculus; Online diagnostics for Math130 and Math140. Discussion on the first three support structures was largely based on feedback received by the ADO. It was found that many of the student support structures available to students at UKZN closely resembled those that were reported on in the literature review, with regard to the findings of Gill and O' Donghue (2007). At UKZN online module websites for each module was a requirement indicated by the school. The online diagnostics were a result of the efforts of a group of interested lecturing staff to set up such diagnostics for students. This was a result of the discussion at the mathematics discipline meeting in 2014, which was indicated under the methodology section.

Tutorials

Tutorial sessions were scheduled for each first year mathematics module. Each session was on average of a three hour duration held weekly for 12 of the 13 weeks of the semester. The organogram showed that a tutor manager was incharge of the allocation of tutors for each module. It emerged that the tutor manager was actually a member of the lecturing staff. The first week of tutorials was lost due to organisational issues, for example identifying suitable tutors, resolving tutors' timetable clashes and obtaining suitable venues. Besides this, the school had to wait for the college to which it was affiliated to put students into tutorial slots, with regard to the allocation of days and times for their mathematics' tutorials. Then module administrators together with the module co-ordinators and lecturers were free to put students into tutorial groups. It emerged that module co-ordinators and lecturers were free to decide how they wanted to conduct and oversee their tutorials; some were organised, others unorganised with students not allocated to a particular group or tutor. The financial constraints allowed in general for 1 tutor for every 30 students registered for a module. Feedback received from the ADO indicated that many of the tutorials were not well attended by the students. It emerged that although the UKZN handbook indicated an 80 percent attendance requirement for tutorials that

requirement was ignored by a large number of students and not enforced by module co-ordinators. This could be viewed as an administrative shortcoming in the context of the argument by Layton (2015) who found that the tutorial system serves as an important intervention to enable students' academic success; especially when one is faced with underprepared first year students.

Hot-seat Tutors

This is a drop-in facility that first year mathematics students could make use of. For 4 hours a day from 10:00 to 14:00, Mondays to Fridays, the school made available a tutor in a designated room to help students. In principle students could approach the hot-seat tutor without an appointment to provide help on any aspect of their module; both for pre-course and in-course content including tutorial work. The ADO indicated that this facility was made use of generally around periods when students had tests or examinations. Further, this facility provided for only some of the first year mathematics modules was made use of by some students. The ADO indicated that generally a large number of those students who needed to consult the hot-seat tutor did not do so. This is consistent with the findings of other researchers (Gill and O'Donoghue 2007; Mathews et al. 2012) that were indicated in the literature review; generally those students who need such support tend not to make use of it.

Supplemental Instruction (SI)

The ADO oversees this and appoints suitable SI tutors. The SI sessions were planned for the core mathematics modules (for example Math130 and Math131). As the name suggests this instruction supplements those that are delivered by the relevant module lecturer(s). Early in the semester the ADO and/or the relevant SI tutor in consultation with the lecturer speaks to the students for about 5 minutes during a lecture period. Students are informed that SI sessions would be held for the module to help them with the course work and they are requested to provide their free periods to enable the timetabling of the sessions. SI sessions were scheduled for about 3 periods (each of 45 minute duration) in the week. The ADO indicated that although the sessions were scheduled in consultation with the students not many of them made use of the sessions on each of the campuses. For example for the mainstream mathematics module on the Westville Campus around 10 students attended each session although there were 442 students registered for the module. Again, this supports the finding of Mathews et al. (2012) who noted that students who need support structures the most tend not to make use of it.

Online Module Websites

A requirement by the school was for each module co-ordinator to setup a module website on the MOODLE platform available at UKZN. There were two MOODLE platforms available: one was maintained by the MOODLE unit attached to the information and communication technology section of the university. The other was the school of MSCS MOODLE platform maintained by the information technology technical support staff of the school. For both those platforms lecturers could request for a site to be approved for their module. A module coordinator from 2013 onwards was free to setup his/her module website on any of those two platforms. The lecturer/module coordinator was free to decide on the layout of the website for his/her module. It was found that some of the sites were well conceived and organised, while others seemed to have been developed unsystematically as the module progressed. In general both of these types of sites served an important communicative function between the lecturer(s) for the module and the relevant tutors and students. This was in the context of guiding those different role-players, sharing of knowledge materials and facilitating knowledge construction. The latter supports the initial assumptions of Brokensha and Greyling (2015) that an effective online instructional design could result in knowledge sharing and co-construction of knowledge. For an example of what appeared on the Math130W1 website see Figure 1. Topics contained in the well organised websites for modules included the following.

- *Notices:* under this topic regular announcements, at least one per week, aimed at keeping students informed of matters relevant to the module were made. One of the purposes of this was to facilitate communica-

tion between the lecturer(s) of the module and the relevant tutors and students.

- *Information and Handouts:* the notices announced to students which documents or information could be found in the information and handouts' folder. Example of these are: module information sheet; general guidelines and requirements relating to what the tutors would look for during each tutorial section; guidelines for content to be studied towards preparation for a particular test.
- *Lecturer or Content:* If there was more than one lecturer for the module, then topics on the MOODLE format were available for each lecturer. The identification was according to the name of the lecturer or the content sections for which the lecturer was responsible. In general electronic copies of content covered during each lecture were made available. The reasoning behind this was that students were not required to take down copious notes during the lecture but rather concentrate on their understanding during the lecture.
- *Tutorials or Homework:* this folder contained the weekly tutorials or homework units that students had to prepare for a particular tutorial session. In some cases those were put up on a weekly basis; in other cases, the work for subsequent weeks was put up well in advance. The latter was to enable those students, who so desired, more time for preparation.
- *Past Tests and Exam Papers:* as the name suggests this contained past tests and examination papers for the module. For some modules this folder also contained the solutions for past tests.
- *Module and Lecturer Evaluations:* towards the end of the semester students were expected to complete online module and lecturer evaluations. What could go into these evaluations was decided by the university's Quality Promotion and Assurance (QPA) unit. Module coordinators and lec-

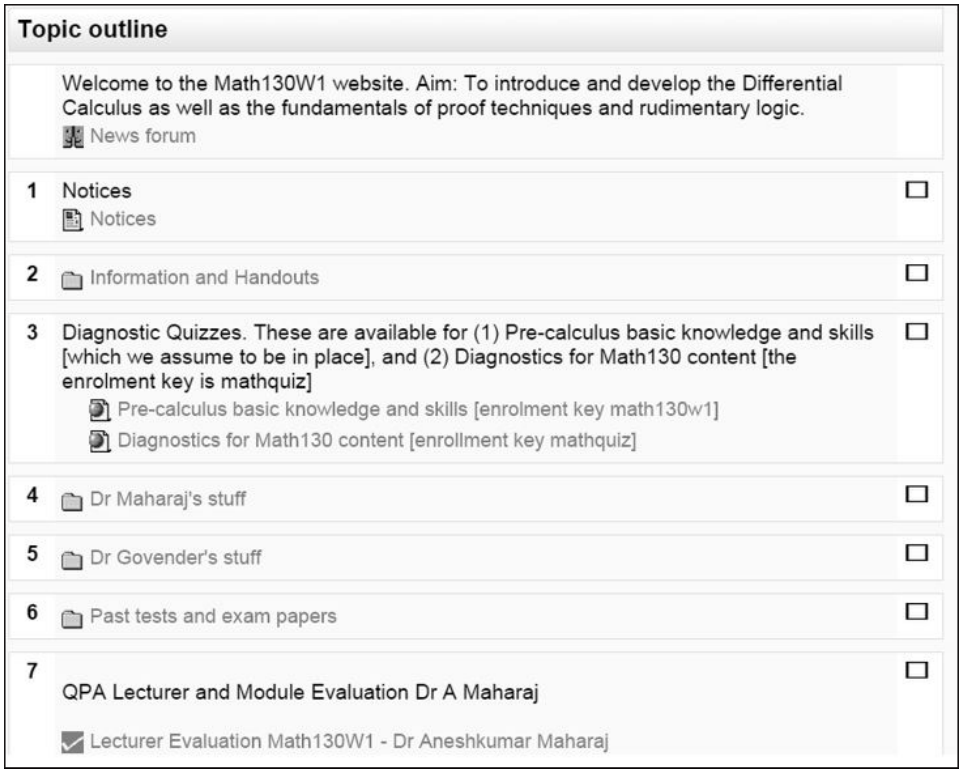

Fig. 1. A snapshot of a website format for the module Introduction to Calculus

turers were expected to make a note of feedback received from students and to take appropriate corrective measures.

Online Diagnostics for Pre-calculus

This support was put in place after many of the first year lecturers provided the following as reasons for the low throughput rate of their students: *They don't know their school work. We don't have time to teach them basics that they should have acquired during their schooling. Increasingly large numbers of students don't have the necessary pre-requisites to study calculus.* To address such concerns, the members of the Mathematics Education Research Group at the university prepared diagnostic questions on the prerequisite knowledge and skills required to study calculus at university level. It was observed that the lecturers of two modules (Math130W and Math150W) both on the Westville Campus made available to their students the diagnostics quizzes that were developed. For example, the module website of Math130W1 (see Fig. 1) under Topic 3 gives the link to the diagnostics for pre-calculus. Upon clicking on that link, students were able to access the Diagnostics for Pre-calculus website (see Fig.2). This suggests that the lecturers for the mainstream *Introduction to Calculus* module adopted an integrated approach in the sense that the support material for underprepared students registered for this module was integrated and provided within the support structures of that mainstream module. In the literature review, the adoption of such an approach was supported by the findings of Complete College America (2012) and the recommendations made by Long (2014). It could be observed from Figure 2 that it was made clear to a student what was expected of him/her (see writing immediately below Topic outline); the diagnostic quizzes focused on background checks (Topic 1), mathematical syntax, vocabulary and implications (Topic 2) and quizzes on grade 12 topics (Topic 3). The data base indicated that in general all those quizzes were attempted by a significant number of students registered for the Math130W1 module, on the Westville Campus. Although the taking of the quizzes was voluntary, that diagnostics' website indicated that student attempts ranged from

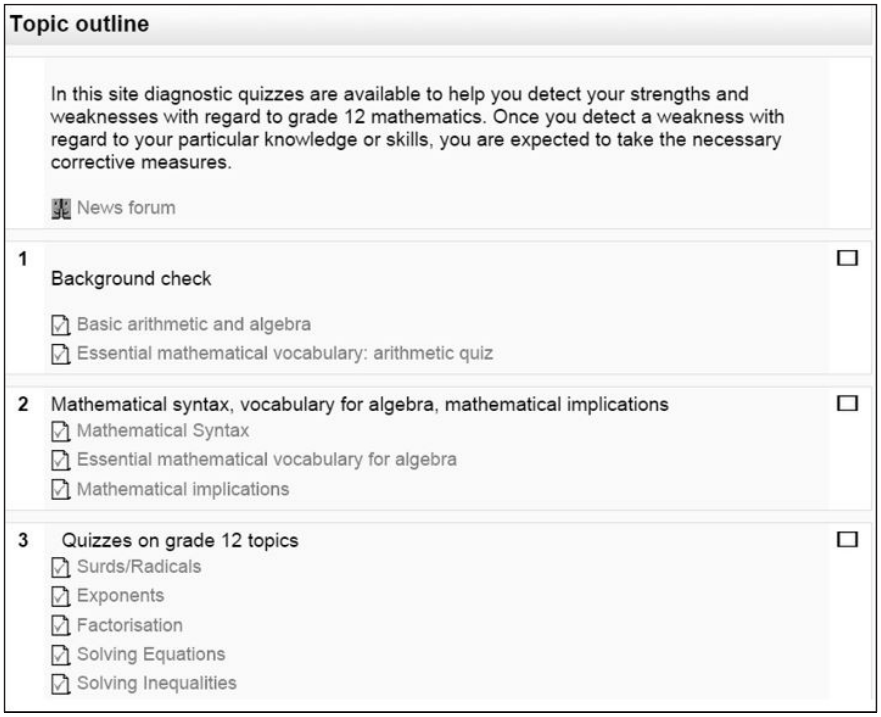

Fig. 2. Snapshot of the Diagnostics for Pre-calculus webpage

108 (for Essential mathematical vocabulary for algebra) to 474 (for Basic arithmetic and algebra); there were attempts for all quizzes that are indicated in Figure 2. There were 442 students registered for the module; some students took the quizzes more than once.

Online Diagnostics for Math130 and Math140

Online quizzes for these modules were inspired by the success of the student usage in the quizzes designed for the pre-calculus. A decision was taken by a group of researchers at UKZN and collaborators from other local institutions (Durban University of Technology, University of Zululand) to develop in-course diagnostics. On the Westville campus of UKZN the quizzes for Math130 and Math140 were piloted during the first and second semesters of 2014, respectively. It was found that the attempts by students for those in-course diagnostics were much lower compared to the pre-calculus diagnostics; at most, about 25 percent of the students registered attempted the in-course diagnostics. This implies that about 75 percent of the students did not make use of this type of online support and this seems to be consistent with the findings of Mathews, Croft, Lawson and Waller (2012) in the sense that those students who need such support the most tend not to access it. See Figure 3 for some of the quizzes that were developed for Math130. For the different topics indicated there were in total 18 quizzes for the students. The snapshot given in Figure 3 is that of a webpage that was undergoing further improvements for implementation in the year 2015. For example the ticks (Topics 1 to 3 and 6) indicate the setup on MOODLE for which the quiz data was generated properly. The quizzes given under Topics 4 and 5 needed to be set up again so that more useful data could be generated. It was observed by a post graduate student who was conducting research on the effectiveness of the online diagnostics that the system statistics counted a single attempt by a student as attempts for all seven quizzes, indicated in Topic 4. The same was also true for the quizzes indicated under Topic 5.

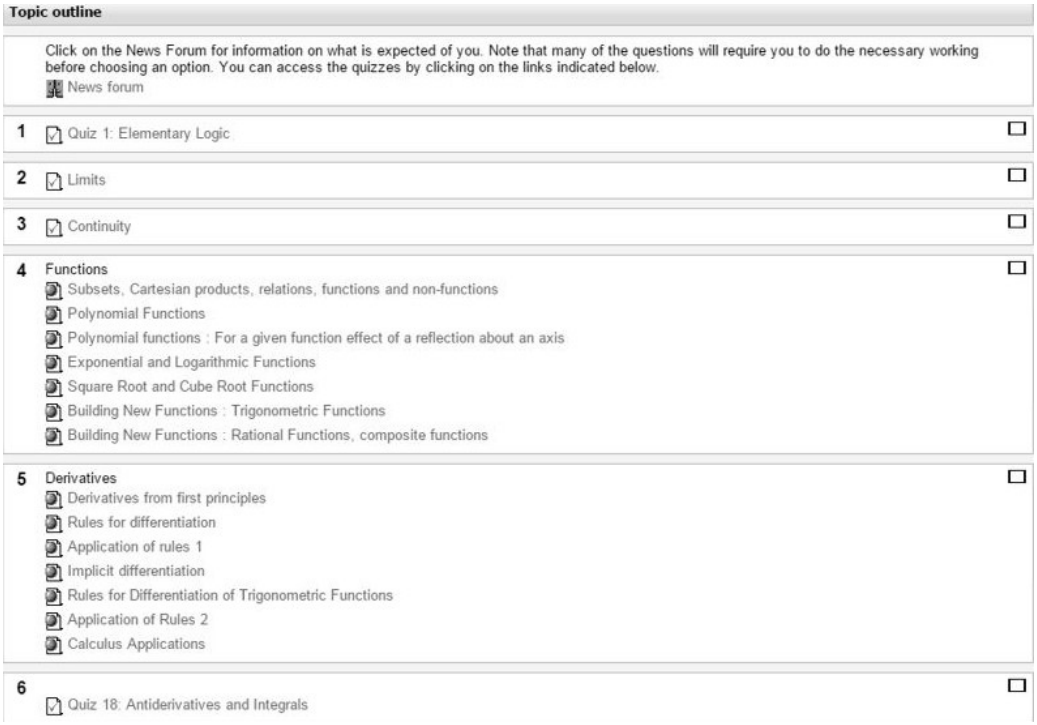

Fig. 3. Snapshot of Diagnostics for Math130

How Could the Structures be Made More Effective in the Sense that They Benefit Students More?

These are indicated under the following subheadings: Handbook requirements; Tutorials; Hot-seat tutors; Supplemental instruction; Websites for modules; Integration of Remedial and Main Course Content: Online Diagnostics.

Handbook Requirements

For each mathematics' module, the handbook indicates the Duly Performance (DP) certificate requirement. The DP requirement is generally given as: 35 percent for class tests; 80 percent attendance at lectures and tutorials. Normally the final mark obtained by a student is calculated as: 33 percent class mark and 67 percent examination mark. Although the handbook included requirements for lectures and tutorials, from the feedback received it was apparent that those requirements were not taken into account when DP certificates were awarded. Lecturers indicated that they did not take attendance into account since they knew their decisions would be overturned when students who satisfied the 35 percent requirement appealed against their DP refusals. Since the minimum pass percentage is 50 there is a need to increase the 35 percent DP requirement for class tests to say 40 percent. Also there is a need to improve on the wording of the DP requirement for tutorials. It should not be restricted to attendance but rather completion of the relevant work for the tutorials. These could lead to an increase in the number of students accessing the support structures provided by the school.

Tutorials

There is a need to have a document that outlines clearly the expectations required from tutors. The school pays for preparation time and the time a tutor spends in tutorial sessions with students. Tutors should be given a contract to sign and this should be enforced. The document should indicate clearly that if it is found by the module coordinator or ADO that a tutor was not prepared for a tutorial session then the tutor will not be paid for preparation and/or that tutorial session. Furthermore, there is a need to improve the organisation of tutorials. The more a tutorial is organised the more likely it is to increase the benefit to students (Maharaj 2012). For students to feel comfortable and to increase their participation during tutorials, they should be allocated a tutorial group that is overseen by a designated tutor. Furthermore, there should be clear completion of a unit requirement to gain a credit for the tutorial. That credit could also be the taking of a tutorial test, as preferred by some of the module co-ordinators. The test could be paper based or online during a time slot of the tutorial. All of these could lead to an improvement in the tutorial system, which is vital if the objective is to enable more students to achieve academic success (Layton 2015).

Hot-seat Tutors

Again for such tutors there needs to be a document indicating what is required of such a tutor and a contract to sign. The ADO should identify at risk students and the requirement should be that such students should consult with a hot-seat tutor at least once a week and a system should be put in place to monitor this requirement. Tracking of such students should be overseen by the ADO who could allocate students to hot-seat tutors. A hot-seat tutor should track interactions with his/her allocated students and their progress at tutorials and for class tests. Such measures could help to reduce the large number of those students who need such support but tend not to make use of it; as confirmed in this study and other studies indicated in the literature review (Gill and O' Donghue 2007; Mathews et al. 2012). In general students should also have online access to a hot-seat tutor, so that they need not physically go to see the tutor for help but rather seek help online. Informal feedback from students indicated that some of the hot-seat tutors do not seem to be interested in helping students but rather to get rid of students and continue with their (the hot-seat tutors') own work. The relevant action needs to be taken when such situations are detected and verified; for example such hot-seat tutors should not be paid for their time for the session and this should to be clearly indicated in the contract.

Supplemental Instruction

For an at risk student SI should be made compulsory. This should be clearly indicated in the form that the student signs when he/she is in-

formed that he/she needs to meet certain targets. The provision of SI should take into account the diagnostic reports of at risk students. Provision should be made for such reports to be available to SI staff. Such measures would address the issue of those students who need such support the most but tend not to make use of it (Mathews et al. 2012).

Websites for Modules

The content section should include in advance lecture outlines and power-point presentations of the relevant content. See Figure 4 for an example of the different folders that could be included for the content section on the website. This should enable those students who so wish to prepare in advance, before they attend a particular lecture.

Integration of Remedial and Main Course Content

Lecturers who feel that their students lack pre-requisites to study their modules, should explore and set up measures online to integrate the sections for which remediation is identified, within the main course content. These could be planned together with the super-tutor (teaching assistant) for the module. For example a notice could be put up on the module website that students need to study certain pre-requisites available on the website before attending a particular lecture. For this to work, proper planning is required. These suggestions are consistent with the recommendations of Long (2014) in the sense that remediation to address the under preparedness of students could be more effective if it is integrated and co-ordinated into the mainstream coursework.

Online Diagnostics

Online diagnostics should focus on addressing under preparedness of students, correct assimilation of the mainstream contents and higher order thinking skills for mathematics. The diagnostics should be made compulsory, feedback should be available to students and also to their relevant tutors to chart the way forward. The entire pre-calculus diagnostics should be taken by the students during their orientation week; both on campus or outside campus. The online diagnostic quizzes need to be made part of the tutorial requirements for the relevant modules. For example, the tutorial sessions are of three hour duration. Designated venues with online computers could be pre-booked and students, as they feel they are prepared, could present themselves to take the quizzes, based on content that was scheduled for the relevant tutorial. Especially for the Math130 and Math140 modules that were identified for improving the pass rates, the taking of the online diagnostics should be made compulsory. Preliminary evidence during 2014 indicated that those students who took the online diagnostic quizzes performed better in their class tests and the examinations. The planning and implementation model of how this could be effectively done should be decided by the relevant module co-ordinators. These suggestions are consistent with an approach recommended by Long (2014). This focuses on the approach labelled as *technology enhanced learning and modularization* which refers to assessments and targeted short tutorials, both online, to provide support.

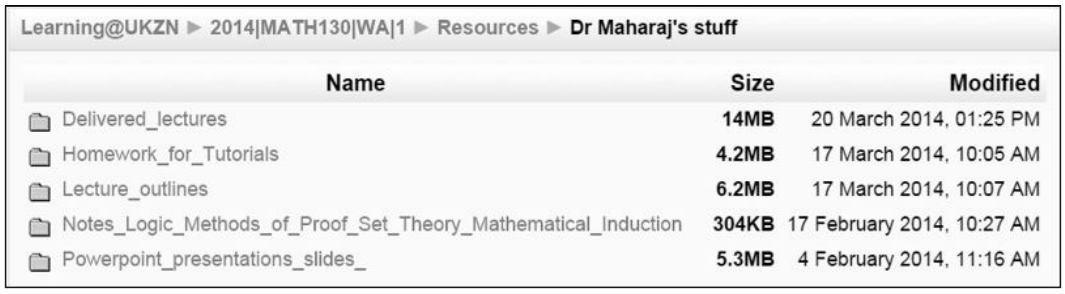

Fig. 4. The different folders that could appear in the content section

CONCLUSION

The support structures provided for mathematics by the School of MSCS at UKZN are in line with such support structures that are offered at universities in the United Kingdom, Australia and Ireland. There is a need and scope for improving the effectiveness of the supported structures that are provided at UKZN. The improvement relates to policy issues, administrative issues and at some point also academic issues.

RECOMMENDATIONS

There is a need to investigate the reasons for relatively lower attempts especially pertaining to some of the more challenging parts of the pre-course and in-course diagnostics that were available. Furthermore, there is a need to investigate the relatively lower usage of the in-course diagnostics that were offered. There is also a need to investigate the reasons from the point of view of students for the following question: Why students who were classified as needing support structures the most were not making use of such structures?

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