STUDENT PROGRESS AND SELF-ASSESSMENT IN ECONOMICS

TL Leshoro, University of South Africa
Z Robinson, University of South Africa
MD Uys, University of South Africa

ABSTRACT

The study follows up on previous studies and provides insights into the factors that best explain student success in economics and appropriate pedagogic intervention such as self-assessment is suggested. Undergraduate third year economics students' results are taken as the yardstick both for monetary and public economics.

The findings suggest that the final marks of macro and microeconomics have a significant impact on the results of third year economics. Other factors such as assignment marks, module repeats, full or part-time studies and age also played a role. The results re-affirm the importance and influence of macro and microeconomics as base knowledge for undergraduate and future graduate work.

Blended and e-learning interventions such as vodcasts were added as remedy and self-assessment is suggested to supplement assignments for future classes.

Keywords*:* Self-Assessment, Student Progress, Public Economics.

INTRODUCTION

The main aim of the paper is the following:

Firstly, the study attempts to investigate the performance from the monetary and public economics third year level modules, with the performance or success rate as the dependent variable. Secondly, the study tests the impact of expertise such as first-year and second-year macro- and microeconomics as pre-requisites on monetary and public economics students' performance. Thirdly the study investigates the possibility of repeated candidates progressing to the next level. Lastly, we capture pedagogic intervention such as vodcasts and alternative, self-assessments in an online environment.

THEORETICAL BACKGROUND

In the current context, it is fitting to explore firstly the factors that best explain the success rate of students. The closest example relating to the current context is student performance in economics and the impact of expertise in related subjects (Wagemans, Valcke and Dochy, 1991). In relation to the impact of prior knowledge on the acquisition of subject-oriented knowledge, their regression analysis revealed that expertise accounted for 37-42% of the variance in post-test scores. This relates to the focus in this paper where the impact of second

year modules as pre-requisites is also tested. Another close comparison is that of Pretorius, Prinsloo and Uys (2009: 140) in the ODL environment, where they found that the successful passing of assignments had the greatest impact on student success, with language and age also playing a role. In another example, the focus was on the success rate of undergraduate taxation students. The following factors, except for gender, had a statistical significant impact on taxation students' academic performance: employment status, language, current and previous academic performance, status of residential area, age and access to technology (De Hart, 2011: 171).

Past literature on the subject matter economics has mainly focused on throughput rates at a first year university level (Smith, 2007). Low success rates at higher education institutions instigated renewed interest in the predictors of academic achievement (Keeve, Naude and Esterhuyse, 2011: 121). This is also the case in the economics modules discussed in this article. Some international studies have been conducted on student performance in economics and the impact of expertise (Wagemans, Valcke and Dochy, 1991), although recent contributions have been scanty. This paper seeks to contribute to existing knowledge and presents follow-up work that have been conducted (Pretorius, Prinsloo and Uys, 2009) in an effort to improve student performance in economics.

Some attention has been given to academic development and pedagogic intervention as tools to improve results. Smith and Edwards (2007: 99) suggest that an academic development preparation course has a major impact on students' performance in first and second-year microeconomics. Matriculation results, mathematics, English first language, physical science and gender are all important determinants of performance. Smith (2009) further found that pedagogic interventions have a positive impact on the performance of students. The key variables that may explain the relative success of such intervention in the academic development course, include the economic, language and communication tutorials, essay writing, the module designed to develop students' quantitative and graphical skills, and smaller class sizes. Improved performance by the mainstream cohort may, amongst others, be due to the more intensive tutorial system. Keeve, Naude and Esterhuyse (2011: 121) found that for three year curriculum students, academic factors such as Grade 12 performance and language proficiency provide a significant explanation. These factors do not apply to four year curriculum students, where psychosocial factors may play a role. Smith and Ranchhod (2012: 431) later conclude that educational interventions in the first-year had a positive impact on the academic performance. Their results further suggest that educational interventions introduced later, in the form of voluntary workshops, improved the academic performance further. Some international studies have been conducted in student success in economics. Athey, Katz, Krueger, Levitt and Poterba (2007: 517) investigated graduate Economics education and student outcomes. They found that first-year grades in core required courses were a strong predictor of economics graduate students' job placements. First year micro and macroeconomics grades were statistically significant predictors of student job placement. One explanation is that these courses directly help to prepare students to be successful researchers. Students could also gain self-confidence or create positive "first impressions" with faculty members. Foreign-trained and male students achieve higher first year grades on average.

When considering more recent international research, it was found that online recorded lectures improved Taiwanese students' performance by 3 to 5 percentage points on average (Chen and Lin, 2012: 6): The finding is significant, because e-learning intervention such as

vodcasts can bridge the gap and provide the necessary knowledge that students may otherwise lack. We therefore also looked at the impact of e-learning tools such as vodcasts on exam performance and/or final marks of the students in specifically public economics.

In later studies, self-regulation and the role of motivation and emotion in online learning were also discovered (Cho and Heron, 2015). Further, Risenga (2010: 85) found that within an ODL institution, there is a strong correlation between exogenous variables such as students' willingness to succeed in their studies and work environment. Variables indigenous to the institutions, such as understandability and clarity of exam papers and study materials, were also found to influence students' performance significantly. The findings suggest that higher education institutions should adapt a holistic and inclusive approach in the design and implementation of measures aimed at facilitating students' performance and to circumvent challenges hampering their success.

THE DATA

Monetary and public economics at third year level are offered as compulsory modules. Macroeconomics at second year level serves as pre-requisite for monetary economics and microeconomics at second year level serves as pre-requisite for public economics. The data for the empirical analysis drew on the first and second semester registrations for 2013 and 2014. These samples comprised approximately 500 to 1000 students.

The subject matter of monetary and public economics third year level is challenging to students. It is an applied macro and microeconomics discipline and students sometimes struggle, because their knowledge and comprehension of second year macroeconomics and microeconomics may not suffice. The student needs to gradually progress to the next level though the successful understanding and mastering of earlier material. With a low pass rate, research and understanding of contributing factors, together with potential solutions for assistance and improvement has become critical.

Profile of Students

The group comprised mainly males (Table A.1-A.4: Annexure), with a mean age of approximately 31 and where students mostly did not study in their home language. The home language is included in the analysis as a reliable indicator of student success. Students that were unemployed or not economically active were regarded as full time students. Those that were not classified were included as part-time students. Within the ODL tuition and delivery framework, students only need to submit two assignments during the semester and no tests are written. For the purposes of this study, the handing in and passing of the two multiple-choice assignments were taken as showing effort and commitment on the part of the student.

EMPERICAL METHODOLOGY AND MODEL SPECIFICS

In order to assist the student, we needed to understand the determining factors in terms of student performance. The model was designed according to previous studies (Pretorius, Prinsloo and Uys, 2009), but additional variables have also been chosen to support the discussion behind the success rate of Monetary Economics students at third year level, namely:

OUTPUT Final_mark_Mon_Ecn_3; Dum_final=f (Age, Ass_1, Ass_2, Dum_fulltime, Dum_HL, Dum_male, Final_mark_ macro 1, Final_mark_macro_2, Repeats_Macro_1 and Repeats_Macro_2).

The dependent variable is effectively the final mark reached, whilst using a dummy variable to indicate pass or failure.

The coefficients, or explanatory variables, consist of the following: Age, assignment marks, number of times module is repeated, dummy time variable ('Dum_fulltime', with a value of 1 for full-time study, else 0), dummy language variable ('Dum_HL', with a value of 1 for study in home language, else 0), dummy gender variable ('Dum_male', with a value of 1 if for male, else 0 if female); final mark reached in macro 1, final mark reached in macro 2 and number of times macro 1 and 2 were repeated.

The methodology supports an ordinary least squares regression analysis and a binary logit model was also investigated in the next section (Table 1).

<table>
<tr><td colspan="2">Table 1
DESCRIPTION OF VARIABLES FOR MONETARY ECONOMICS</td></tr>
<tr><td colspan="2">Dependent variables</td></tr>
<tr><td>Finalmark_Mon_Ecn_3</td><td>Final mark scored by the student in Monetary Economics</td></tr>
<tr><td>Dum_Final</td><td>Taking a value of 1 if passed and 0 if failed</td></tr>
<tr><td colspan="2">Explanatory variables</td></tr>
<tr><td>Age</td><td>Age of the student</td></tr>
<tr><td>Assignment_1</td><td>Mark of assignment 1</td></tr>
<tr><td>Assignment_2</td><td>Mark of assignment 2</td></tr>
<tr><td>Finalmark_Macro_1</td><td>Final mark in Macroeconomics 1</td></tr>
<tr><td>Finalmark_Macro_2</td><td>Final mark in Macroeconomic 2</td></tr>
<tr><td>Repeat_Macro_1</td><td>Number of times repeated Macroeconomics 1</td></tr>
<tr><td>Repeat_Macro_2</td><td>Number of times repeated Macroeconomics 2</td></tr>
<tr><td>Dum_HL</td><td>Taking a value of 1 if studying in home language and 0 if not</td></tr>
<tr><td>Dum_Male</td><td>Taking a value of 1 for male students and 0 for females</td></tr>
<tr><td>Dum_full</td><td>Taking a value of 1 for full time students and 0 for part time</td></tr>
</table>

Table 2 ORDINARY LEAST SQUARES WITH FINALMARK_MON_ECN_3 AS DEPENDENT				
Variable	Coefficient (2013)	Prob.	Coefficient (2014)	Prob.
C	-18.22419	0.0022	-24.69277	0.0000
FINMRK_MACRO_1	0.579392	0.0000	0.541696	0.0000
FINMRK_MACRO_2	0.175308	0.0234	0.269930	0.0000
REPTS_MACRO_1	2.828025	0.0024	-0.947505	0.2485
REPTS_MACRO_2	-2.399020	0.0018	-0.645821	0.3347
DUM_MALE	0.241508	0.8384	1.181407	0.2291
DUM_HL	2.243905	0.0805	1.232455	0.2230
DUM_FULL	0.382191	0.7750	1.066901	0.3333
AGE	-0.055868	0.4857	-0.019390	0.7906
ASS 1	0.186665	0.0000	0.233875	0.0000
ASS 2	0.085210	0.0322	0.077657	0.0277
R-squared	0.261370		0.285452	
Observations	675		977	

For public economics, the model is similar to monetary economics and as follows:

OUTPUT Final_mark_Public_Ecn_3; Dum_final=f (Age, N_Ass_1, Ass_1, Dum_fulltime, Dum_HL, Dum_male, Final_mark_ Micro 1, Final_mark_Micro_2, Repeats_Micro_1 and Repeats_Micro_2). The dependent variable is effectively the final mark reached, whilst using a dummy variable to indicate pass or failure.

The coefficients or explanatory variables, consist of the following: Age, assignment marks, number of times module is repeated, dummy time variable ('Dum_fulltime', with a value of 1 for full-time study, else 0), dummy language variable ('Dum_HL', with a value of 1 for study in home language, else 0), dummy gender variable ('Dum_male', with a value of 1 if for male, else 0 if female); final mark reached in micro 1, final mark reached in micro 2 and number of times micro 1 and 2 were repeated (Table 3).

Table 3 DESCRIPTION OF VARIABLES FOR PUBLIC ECONOMICS	
Dependent variables	
Finalmark_Public_Ecn_3	Final mark scored by the student in Public Economics 3
Dum_Final	Taking a value of 1 if passed and 0 if failed
Explanatory variables	
Age	Age of the student
Assignment_1	Mark of assignment 1
Assignment_2	Mark of assignment 2
Finalmark_Micro_1	Final mark in Microeconomics 1
Finalmark_Micro_2	Final mark in Microeconomics 2
Repeat_Micro_1	Number of times repeated Microeconomics 1
Repeat_Micro_2	Number of times repeated Microeconomics 2
Dum_HL	Taking a value of 1 if studying in home language and 0 if not
Dum_Male	Taking a value of 1 for male students and 0 for females
Dum_full	Taking a value of 1 for full time students and 0 for part time

Table 4 ORDINARY LEAST SQUARES WITH FINALMARK_PUBLIC_ECN_3 AS DEPENDENT				
Variable	**Coefficient (2013)**	**Prob.**	**Coefficient (2014)**	**Prob.**
C	5.413997	0.4256	2.754277	0.6343
FINMRK_MICRO_1	0.270424	0.0049	0.341117	0.0000
FINMRK_MICRO_2	0.356849	0.0000	0.274414	0.0001
REPTS_MICRO_1	-0.689490	0.4573	-0.965019	0.2211
REPTS_MICRO_2	-2.360518	0.0003	0.070439	0.9078
DUM_FULL	-2.396726	0.1271	-6.351152	0.0000
DUM_HL	4.161143	0.0077	-1.378711	0.3346
DUM_MALE	0.699883	0.6155	0.330814	0.8025
AGE	-0.244020	0.0133	-0.190912	0.0316
ASS 1	0.100956	0.0010	0.192202	0.0000

ASS 2	0.146511	0.0000	0.132208	0.0000
R-squared	0.228863	0.4256	0.244474	
Observations	643		712	

The low predictive power or R-squares of the regressions can be explained by the fact that this study focused on student-specific factors only and thus ignored the characteristics of the specific institution, the impact of curriculum choices, and the impact of the characteristics of the staff involved in teaching, including e-learning solutions, that may almost certainly also have an impact on student success (Pretorius, Prinsloo and Uys, 2009: 152).

The results suggest that the final marks of macroeconomics first and second year level have a significant impact on the final mark of monetary economics (Table 2). We did not foresee the problem of multicollinaerity because we did verify our results with previous studies that have been conducted in the field. Also for example: *OUTPUT Final_mark_Mon_Ecn_3; Dum_final=f* (*Age, Ass_1, Ass_2, Dum_fulltime, Dum_HL, Dum_male, Final_mark_ macro 1, Final_mark_macro_2, Repeats_Macro_1 and Repeats_Macro_2*). The final mark of monetary economics third year is predicted by the assignment 1 and 2 (third year) but also the final marks of macroeconomics first year and second year. There was no multicollinaerity problem between the marks.

For public economics (Table 4), the results suggest that the final marks of first and second year microeconomics have a significant impact on the final mark of public economics. This was to be expected as monetary and public economics are macro and microeconomic based. The first year level result coincides with the findings of Athey, Katz, Krueger, Levitt and Poterba (2007: 512), in the sense that it is the core course or module for an economics graduate student.

The better the student performs in the assignments, the better the final mark of the student. Although home language can be considered as a contributor, it is not consistent year on year, due to the fact that a third year student is a senior and more mature student in their studies. Indeed, many of the students can be considered as studying part-time and it is possible that they are active within an environment where English is the main language of communication.

In terms of the public economics, full time students tend to perform poorly in terms of final marks whilst part-time students tend to fair better. It therefore seems appropriate to conclude that the part-time student is more efficient in terms of time management. Age seems to become a factor, to the extent that the older the student becomes and the more they repeat the module, the lower the final marks achieved. A significant time gap may also exist between second and third year economics. The student may require remedial (extra) work to catch up.

BINARY LOGIT RESULTS

In order to explain the results under section 3.2 further, the binary logit method is used to verify findings. The dependent variable is the dummy final mark, which takes a value of 1 when monetary economics was passed and 0 when it was failed. Table 5 shows the binary logit results. The results of the binary logit models are interpreted differently from the OLS results.

The direction of the effect of a change depends on the sign of the estimated coefficient. Positive values imply that increases in the explanatory variables will increase the probability of the student passing the module, while negative values imply that increases in the explanatory

variables will decrease the probability of the student passing. It was found that the more the student repeated monetary economics in previous years of study, the probability to pass monetary economics decreased.

The assignment marks also mattered and are important and the better they perform in the assignment, the better their chances to pass monetary economics. Home language could still be considered a factor, which tends to affect their chances of passing monetary economics.

Table 5 BINARY LOGIT MODEL WITH DUM_FINAL OF MONETARY ECONOMICS AS DEPENDENT				
Variable	**Coefficient (2013)**	**Prob.**	**Coefficient (2014)**	**Prob.**
C	0.872700	0.1488	-1.930345	0.0002
REPEATS_MON_ECN_3	-2.757691	0.0000	-1.340955	0.0000
REPTS_MACRO_1	0.447162	0.0148	0.025929	0.8468
REPTS_MACRO_2	0.039621	0.8059	0.102161	0.3463
DUM_HL	0.841642	0.0004	0.296638	0.0722
DUM_MALE	0.019153	0.9286	0.384121	0.0176
DUM_FULL	0.008328	0.9697	-0.011817	0.9429
ASS1_	0.018443	0.0169	0.038031	0.0000
ASS2_	0.011746	0.0870	0.012073	0.0392
MacFadden R-Squared	0.402422		0.248532	
Observations	675		916	

For public economics, the dependent variable is the dummy final mark, which takes a value of 1 when public economics was passed and 0 when it was failed. Table 6 shows the binary logit results. The results of the binary logit models are interpreted differently from the OLS results. It was found that the more the student repeated public economics in previous years of study, the probability to pass public economics decreased. The more they repeated second-year microeconomics, their probability of passing public economics got lower. The assignments are important and the better they perform in the assignments, the better their chances to pass public economics. Although inconsistent year on year, home language could still be considered a factor, which tends to affect their chances of passing public economics.

Table 6 BINARY LOGIT RESULTS WITH DUM_FINAL OF PUBLIC ECONOMICS AS DEPENDENT VARIABLE				
Variable	Coefficient (2013)	Prob.	Coefficient (2014)	Prob.
C	1.817988	0.0000	-0.437479	0.2207
REPEATS_PUBLIC_ECN_3	-2.438567	0.0000	-0.741998	0.0000
REPTS_MICRO_1	0.176145	0.2189	-0.034761	0.7336
REPTS_MICRO_2	-0.211410	0.0667	-0.029002	0.7214
DUM_HL	0.843319	0.0005	0.107876	0.5687
DUM_MALE	0.308493	0.1427	0.261599	0.1325
DUM_FULLTIME	0.151004	0.4791	-0.795945	0.0000
ASS1_	0.006304	0.1829	0.024741	0.0000
ASS2_	0.020497	0.0000	0.015852	0.0003
MacFadden R-Squared	0.354164		0.166771	
Observations	643		712	

In order to explain all the possible outcomes, the OLS and binary logit results were repeated because two modules, namely Monetary and Public Economics were considered. In order to verify the regression results, we explained the repeats in terms of a binary logit method. We found that the more the students repeated these modules in previous years, the probability to pass these modules became less. The repeats include candidates for supplementary examinations. The causal effects are not always clear-cut but we do know that some candidates become constant "repeaters" and these candidates do not normally register again for the modules. They therefore are not assisted in terms of student support and additional material for improvement. However, academic progression rules should place a cap on the tendency of constant repetition in the longer run.

PEDAGOGIC INTERVENTION

Blended and e-learning remedies such as vodcasts were implemented in public economics as from 2015. We are also in a process of uploading self-assessments for the second year, macroeconomics and third year, public economics. The self-assessment is proposed in order to supplement assignments which are critical in promoting student progress (see section 3). Further, self-assessment makes connectivism and self-directed learning possible in online economics modules. Hase and Kenyon (2000) speak of heutagogy or the so-called self-determined learning. Learning is not teacher- or curriculum-centric, but learner-centric. The learner know how and where to learn. The so-called third wave of distance and online education (DE) has been driven by globalization and the information age, along with an increased demand for knowledge workers. The evolving Internet and a digital learning environment changed DE further.

Asynchronous and synchronous forms of communication in one place became now possible. Online learning has become available to anyone with a computer and access to the Internet.

Corporate universities and virtual schools developed to feed the demand for lifelong learning. The rise of the "challenge-driven university" has changed the face of education in which projects by students become sponsored by companies as well as the instructors (Anon, 2016).

The fourth wave in DE has brought exiting new theories to the fore with a changing role for both the instructor and student. Teaching and learning has changed tremendously with the student becoming much more self-directed and the lecturer or instructor use various online tools such as additional material, i.e., video clips (vodcasts) and self-assessments to reach the student. Kitzito (2016) emphasizes the role of the necessary infrastructure and the willingness of the student to engage within an online environment. Mobile phone technology becomes the solution for emerging economies.

CONNECTIVISM AND SELF-DIRECTED LEARNING

The theory of connectivism is a recent addition, with online learning becoming a self-directed activity. Heutagogy (knowing how and where to learn) explains self-determined learning, expanding on andragogy, in which the learner decides the path of learning (Hase & Kenyon, 2000). Learning occurs as the result of creating environments/networks (Siemens, 2005). However, lecturers and instructors still need to place the needs of the student first, where many may not yet be prepared for self-directed learning. Greater empathy and instant feedback from the instructors will ensure students remain inspired and focussed. Connectivism, especially at graduate level, brings most things together, though the role of behaviourism, cognitivism and constructivism should not be ignored (Siemens, 2005).

Conradie (2014) explores whether self-directed learning is taking place through connectivism within personal learning environments. Although androgogy, behaviourism, cognitivism and contructivism all rely on the learner's know-how, connectivism goes a step further and include an active learner engaging in learning through systems and networks and the know-where. Self-directed learning is thus the active learner designing his/her own learning path though e-learning or Web 2.0 participation and collaboration between learner and teacher or tutor.

As part of the methodological analyses, 76 participants in an Information and Communication Technology class were included. Interviews were conducted with open- and closed-ended questions in terms of motivation, engagement, collaboration and self-actualisation. The main idea was thus to find out whether connectivism leads to more motivated learners, a higher engagement by learners, facilitating more collaboration between learners and more encouraged learners. The main findings assert that learners were motivated and engaged supported by collaboration and self-actualisation. The learners did however find the self-direction challenging especially in the beginning when more training becomes essential.

Little research has been conducted on alternative assessments with specific reference to formative assessment within an open and distance learning environment. Singh, Bezuidenhout and Prinsloo (2010) noted that the frequency of formative assessment is problematic and recommended that self-assessment be promoted in modules with few (two) assessment

opportunities. Current and relevant research in terms of alternative assessment and curriculum development has become essential.

METHODOLOGY AND EXPERIENCE

Self-assessment, as instrument in which the student engage within an online learning environment, anytime, anywhere, as alternative pedagogic tool are being implemented for second-year macroeconomics students and third year public economics students. Ultimately the student should become more connected and self-directed in preparing for summative assessments or examinations. A variety of options exist for an alternative assessment, for example a portfolio of evidence, a written assignment or an electronic based assessment.

We identified the electronic assessment tool (SAmigo), which is currently available on the MyUnisa learning management system, as best suited for macroeconomics second year due to the high student numbers (2000 on average per semester) and third year numbers (500-600 students per semester). Siemens (2005) argue that large student numbers can be reached, especially also with Massive Online Open Courses (MOOCs). The self-assessment thus rely more on the construction of knowledge also and how to use this knowledge (connection).

Alternative formative assessment improves the validity of the assessment because the questions are randomly generated from a pool of questions from a question bank uploaded electronically. No two students receive the same assignment, thereby lessening the risk of group cheating whilst all the study outcomes are tested consistently. After submitting the assignment, students will be able to immediately access feedback for the specific questions they answered (questions are randomly generated from a pool of questions).

PROPOSED EMPERICAL MODEL

After implementing the self-assessment, we want to investigate student progress or success in macroeconomics and consequently first year macroeconomics as well as public economics. We propose an empirical model that investigates the factors or predictors that may best explain the success rate in the subject field as explained in section 3. The results may amongst others, promote a more efficient, effective and economic e-learning environment. Although not completely connectivist in the true sense of the word, the ideal is to promote connectivist approaches, e.g. e-portfolios, blogs, and etc., but at a graduate level.

Experiences can display connectivist features. In order to make a module more connectivist, the students and instructor could debate topics and negotiate which individuals will teach them based on the connections to that topic. Group discussions would have to play a larger role in especially graduate economics modules than presently observed. Finally, the module could continue after the formal module ended and later we could transform it into a MOOC where connectivism is crucial. New kinds of modules and learning can become evident (Barnett, McPherson & Sandieson, 2013).

Connectivist principles can partly be adopted in an online environment, even in an undergraduate module such as our second-year macroeconomics and third year public economics module. The student becomes much more self-directed and autonomous in learning. However, our students are not always ready for networks of connections and sometimes the instructor loses

site of this fact when there is an urgent need for intervention. In future, we would like to make our students more independent in their learning and implement and promote a much broader interface for specifically our online graduate modules in economics. E-portfolios, blogs, twitter, etc. might encourage our students to actually participate online. The problem of large student numbers can be addressed by using our e-tutors more frequently. It emerged from the findings of the study that prior knowledge of the subject field expertise has become critical and remedial action compulsory.

The findings of the study and remedial action could also be extended to a graduate level, e.g. the Honors level in future, where the degree compilation of various universities become important for benchmarking. The evaluation of further online interventions such as self-assessments will be tested in future.

CONCLUSION

The current study adds empirical evidence to the existing body of literature on the subject matter economics and the use of remedial e-learning outcomes. The study re-affirms that expertise such as second year base knowledge and supports are necessary to enhance students' success rate in economics. More empirical research investigating final marks after remedial online action has been taken, will extend theories to online environments and improve efforts to enhance student success in online economics courses more generally.

The intention was to explore the factors that explain the success rate of monetary and public economics third year level students. The results suggest that:

- The final marks of first year macro-, microeconomics and especially second year macro, microeconomics have a significant impact on the final mark of third year monetary and public economics. This was to be expected in the sense that both module contents are macro and microeconomic based.
- Higher marks for the assignments results in a higher final mark of the student.
- Home language appears to improve the chances of the third year student to pass, although by that stage, the student is more senior and mature with respect to their studies.
- Full time students tend to perform poorly in terms of final marks whilst part-time students tend to fair better. It therefore seems appropriate to conclude that the more a student has to do, the more the student gets done.
- Age seems to become a factor, to the extent that the older the student becomes the lower the final marks achieved.
- A significant time gap may also exist between second and third year economics. The student may require remedial (extra) work to catch up.
- The more the student repeats third year economics, the less their chances of passing the third year modules. Some candidates become constant "repeaters" and these candidates do not normally register again for the modules. It seems then that supplementary examinations become a repeated exercise over time without the necessary positive results. Academic progression and submission rules do however exist and could serve as a cap on repeats.

- The assignments are important in that the better they fair in the assignments, the better their chances of passing third year economics modules.

The results show that further pedagogic intervention is required to improve student marks. Alternative assessments to supplement assignments are proposed as a future outcome. Students should become more connected, independent and self-directed in their learning through self-assessments. This kind of pedagogic interventions should assist with a more efficient, effective and economic e-learning environment.

REFERENCES

Anon. (2016). Flying high. *Economist*, 2016. Retrieved from http://www.economist.com/news/international/21701081-new-crop-hands-universities-transforming-how-students-learn-flying-high.

Athey, S., Katz, L.E., Krueger, A.B., Levitt, S. & Poterba, J. (2007). What does performance in graduate school predict? Graduate Economics education and student outcomes. *AEA Papers and Proceedings*, *97*(2), 512-518.

Barnett, J., Mcpherson, V. & Sandieson, R.M. (2013). Connected teaching and learning: The uses and implications of connectivism in an online class. *Australasian Journal of Educational Technology*, *29*(5), 685-699.

Chen, J. & Lin, T. (2012). Do supplemental online recorded lecturers help students learn microeconomics? *International Review of Economics Education*, *11*(1), 6-15.

Cho, M.H. & Heron, M.L. (2015). Self-regulated learning: The role of motivation, emotion and use of learning strategies in students' learning experiences in a self-paced online mathematics course. *Distance Education*, *36*(1), 80-99.

Conradie, P.W. (2014). Supporting self-directed learning by connectivism and personal learning environments. *International Journal of Information and Education Technology*, *4*(3), 254-259. http://doi.org/10.7763/IJIET.2014.V4.408

De Hart, K., Doussy, E., Swanepoel, A., Van Dyk, M., De Clerq, B. & Venter, J. (2011). Increasing throughput: Factors affecting performance of entry-level undergraduate taxation students at an ODL institution in South Africa. *Progressio*, *33*(1), 171-188.

Hase, S. & Kenyon, C. (2000). *From andragogy to heutagogy*. In UltiBase Articles. Retrieved from http://www.psy.gla.ac.uk/~steve/pr/Heutagogy.html

Keeve, A., Naude, L. & Esterhuyse, K. (2012). Some predictors of academic performance of first-year students in three and four year curricula. *Acta Academica*, *44*(1): 121-158.

Kizito, R.N. (2016). Connectivism in learning activity design: Implications for pedagogically-based technology adoption in African higher education contexts. *International Review of Research in Open and Distance Learning*, *17*(2), 19-39. http://doi.org/10.19173/irrodl.v17i2.2217

De Metz, N. & Cohen, T. (2014). The perceptions of first year business management students of an online self-assessment tool within an ODL context. *Progressio*, *36*(1), 129-156.

Pretorius, A.M., Prinsloo, P. and Uys, M.D. (2009). Student performance in introductory microeconomics at an African open distance learning institution. *Africa Education Review*, *6*(1), 140-158.

Risenga, A. (2010). Attributes of students' success and failure in typical ODL institutions. *Progressio*, *32*(2), 85-101.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology & Distance Learning, 2*(1).

Singh, D., Bezuidenhout, R. & Prinsloo, P. (2010). Implementing the senate dicisions of 2 June 2010 on alternative assessment strategies and tools. Retrieved from: http://uir.unisa.ac.za/bitstream/handle/10500/3614/Alternative%20assessments%20210910.pdf.txt?sequence=3

Smith, L. and Edwards, L. (2007). A multivariate evaluation of mainstream and academic development courses in first year microeconomics. *South African Journal of Economics*, *75*(1), 99-117.

Smith, L.C. (2009) An analysis of the impact of pedagogic interventions in first year academic development and mainstream courses in microeconomics. *South African Journal of Economics*, *77*(1), 162-178.

Swan, K. (2010). Teaching and learning in post-industrial distance education. In M. F. Cleveland-Innes & D.R. Garrison (Eds.), *An introduction to distance education: Understanding teaching and learning in a new era* (pp. 108-134). New York & London: Routledge.

Wagemans, L.J., Valcke, M. and Dochy, F. (1991). Learning economics at a distance: Quality and impact of expertise. *Distance Education*, *12*(2).

ANNEXURE

Table A.1
DESCRIPTIVE STATISTICS OF MONETARY ECONOMICS FOR 2013

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
FINALMRK	675	43.56	17.30	2	93
FINMRK_ECS1028	675	56.77	9.13	50	89
FINMRK_ECS202B	675	55.77	7.87	50	93
REPTS_ECS1028	675	0.88	0.75	0	8
REPTS_ECS202B	675	1.09	0.88	0	8
DUM_FULL	675	0.39	0.49	0	1
DUM_HL	675	0.35	0.48	0	1
DUM_MALE	675	0.51	0.50	0	1
AGE	675	33	8.21	22	60
ASS 1	675	75.10	17.64	10	100
ASS 2	675	75.03	18.91	10	100

Table A.2
DESCRIPTIVE STATISTICS OF MONETARY ECONOMICS FOR 2014

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
FINALMRK	977	45.71443	17.83	0	93
FINMRK_ECS1028	977	6.86	8.97	50	97

FINMRK_ECS202B	977	57.21	9.20	50	96
REPTS_ECS1028	977	0.41	0.68	0	8
REPTS_ECS202B	977	0.44	0.87	0	8
DUM_FULL	977	0.38	0.49	0	1
DUM_HL	977	0.43	0.49	0	1
DUM_MALE	977	0.52	0.50	0	1
AGE	977	31	7.87	20	70
ASS 1	977	75.70	16.71	10	100
ASS 2	977	79.60	16.85	10	100

Table A.3
DESCRIPTIVE STATISTICS OF PUBLIC ECONOMICS FOR 2013

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
FINALMRK	643	43.56	19.42	2	93
FINMRK_ECS1016	643	55.69	7.86	50	89
FINMRK_ECS201A	643	59.80	10.85	50	93
REPTS_ECS1016	643	0.84	0.81	0	8
REPTS_ECS201A	643	1.01	1.16	0	8
DUM_FULL	643	0.59	0.49	0	1
DUM_HL	643	0.30	0.46	0	1
DUM_MALE	643	0.53	0.50	0	1
AGE	643	33	8.03	22	60
ASS 1	643	48.80	22.88	10	100
ASS 2	643	51.64	23.36	10	100

| OTHER_MODULES | 643 | 6.53 | 3.98 | 0 | 19 |

Table A.4
DESCRIPTIVE STATISTICS OF PUBLIC ECONOMICS FOR 2014

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
FINALMRK	712	45.83	19.22	0	93
FINMRK_ECS1016	712	57.83	9.54	50	97
FINMRK_ECS201A	712	59.20	10.59	50	96
REPTS_ECS1016	712	0.68	0.89	0	8
REPTS_ECS201A	712	0.81	1.16	0	8
DUM_FULL	712	0.48	0.50	0	1
DUM_HL	712	0.31	0.46	0	1
DUM_MALE	712	0.56	0.50	0	1
AGE	712	32	8.26	20	70
ASS 1	712	52.96	20.84	10	100
ASS 2	712	51.54	21.29	10	100
OTHER_MODULES	712	8.80	4.82	0	20