

## CHAPTER 7

### CONCLUSION AND RECOMMENDATIONS

#### 7.1. TESTING THE HYPOTHESES

The aim of study was to investigate the readiness characteristics that determine risk, for either failure or withdrawal. The initial hypothesis was that student readiness characteristics directly affect the student's likelihood of withdrawal or failure. These hypotheses were subsequently refined to the following hypotheses for this study:

1. Students who score high on the 'Academic Readiness Questionnaire' factors will have higher academic performance than students who perform lower on the questionnaire factors.
2. Students who score low on the 'Academic Readiness Questionnaire' factors are more likely to withdraw from their studies than students who score higher on the questionnaire factors.
3. Student readiness characteristics directly affect the likelihood of withdrawal.
4. Student readiness characteristics directly affect academic performance at first year.
5. Academic performance is an intervening variable for withdrawal.
6. The predictors of risk for failure will differ between the racial groups.
7. The predictors of risk for withdrawal will differ between the racial groups.

**Hypothesis 1** regarding the Academic Readiness Questionnaire's ability to predict risk for failure could not be verified in its entirety. Only two of the sub-scales, namely goal orientation and learning-efficacy, demonstrated predictive validity in screening for a risk for failure. Students who score high on the two sub-scales will have higher academic performance compared to students who has lower scores on the sub-scales. The

practical significance of the two sub-scales on its own is limiting if high school academic achievement (M-score) and biographical variables are excluded in the risk model. Contrary to expectations, the two ARQ sub-scales are therefore only able to provide incremental validity, and should be considered as one of a series/range of measures proposed as part of an early warning system.

**Hypothesis 2** regarding the Academic Readiness Questionnaire's ability to predict risk for withdrawal could not be verified. Only the reading behaviour sub-scale showed a significant relationship in screening for risk for withdrawal. This relationship was in a negative direction, indicating that students who score high on the reading behaviour factor are more at risk for withdrawal.

**Hypothesis 3** relates directly to the proposition that Tinto (1993) made. The hypothesis was accepted partially because four variables were statistically significant in explaining risk for withdrawal. The variables are M-score, race language, reading behaviour and credits registered. The major reason for withdrawal as identified during exit interviews was study choice, resulting in being unmotivated, not going to class and having poor academic performance. Thus, not enjoying the course or not identifying with it has an adverse effect on academic achievement. Students who study their second choice are also at risk for withdrawal, because there is a mismatch between the programme and their interest (Du Plessis et al., 2006; Johnston, 2000; Jones et al., 2008). The distance of the parental home seems to be a predictor of risk for withdrawal. Financial pressure on the student has a direct influence on the ability to pay for studies and living costs while studying at university and contributes to withdrawal early in the year.

**Hypothesis 4** is partially accepted, because only nine variables were statistically significant in explaining risk for failure (academic success). The variables are M-score, race language, credits registered, goal orientation, learning-efficacy, gender, distance of school, reading behaviour and parental education at the University of Pretoria.

**Hypothesis 5** is accepted, because risk for withdrawal is highly correlated with prior academic performance (M-score). Academic achievement has a high negative correlation with withdrawal behaviour. Students with lower academic achievement at school are more likely to be discontinued by the faculty and to withdraw on a voluntary basis.

**Hypothesis 6** is accepted, because the predictors of risk for failure differ between the racial groups. The variables that predict risk for failure for white students are M-score, goal orientation, credits registered, learning-efficacy, gender, and parental education at UP. The variables that predict risk for failure for African students are M-score, credits registered, and parental education at UP.

**Hypothesis 7** could not be verified, as race language is grossly skewed for risk for withdrawal where actual frequencies (cross-tabulations) indicate that only 3% of African students are at risk in comparison to Afrikaans (14.6%) and English (13.4%) students who are at risk. Subsequent analyses that differentiate between races are therefore not possible.

## 7.2. SUMMARY OF A READINESS AND RETENTION MODEL

Based on the statistical analysis, the readiness and retention model discussed in Chapter 2 will be reviewed to include the readiness characteristic that reached statistical significance, as well as the salient readiness factors that emerged from the exit interviews. The assumptions for the readiness and retention model are borrowed from Bandura (1986, 2006), Bean and Eaton (2000) and Conley (2007), namely:

- action precedes outcomes;

- cognitive processes such as evaluating, intending and monitoring precede behaviour;
- psychological processes lead to attitudes about one-self;
- behaviour, personal variables and the environment are in dynamic and in reciprocal interaction with each other; and
- the elements of readiness are neither mutually exclusive nor perfectly nested in the model.

The readiness characteristics, based on the analysis are:

- High school achievement (M-score);
- Race language;
- Credits registered;
- Goal orientation;
- Learning-efficacy;
- Gender;
- Distance of school;
- Reading behaviour;
- Parental education at the University of Pretoria;
- Study choice;
- Distance of parental home; and
- Financial pressure of the student to pay for studies and living costs.

The readiness and retention model will focus predominantly on the readiness characteristics that students present upon entering the faculty and institution and the contextual or environmental dimension in which the readiness characteristics are nested.

Students undergo a transition phase as they enter the institutional environment. According to the readiness and retention model, the students who are ready for university education are more likely to have a smoother transition phase, be academically successful, and persist (Conley, 2007). These students are more able to adapt to the university environment because they are able to strengthen their resources

(Schlossberg et al. 1995). These resources consist of a support structure of family and friends, personal psychological resources like self-efficacy and locus of control, and strategies like coping, information seeking and increasing effort.

The contextual dimension in this model can be subdivided into three sub-dimensions that together determine an individual's unique contextual situation. The three sub-dimensions are the parental, school, and financial dimensions. The contextual dimension functions as the 'cradle' for the development of psycho-social and cognitive skills that are expressed in behaviour, thoughts and emotions (Bandura, 1986).

The parental sub-dimension incorporates the educational level of the parents or guardians and the level of support that this sub-dimension is able to provide to the student before entering and during the student life cycle at the institution. The parental sub-dimensions will ultimately influence the quality of the interactions with the academic and social communities in the institutional dimension. The parental sub-dimension was predictive of risk for failure only (refer to Appendix Table B.8. and B.9.).

The school sub-dimension indicates where students completed their senior certificate. The province where students completed their high school certificate does not only provide some indication of the distance of the school from the university, but also gives an indication if the school is centred in an urban or rural region. The schools from other provinces that are part of the feeding schools of the university are more frequently rural, farm communities or medium sized cities. The distance of the school also gives an indication of the distance of the parental or family support of the students. Students usually go to the school nearest to their parents' or family's home.

The financial sub-dimension refers to the socio-economic circumstance of the students and their ability to pay for their studies. Students who interpret the cost of their education to be more than the perceived value of an education are more likely to withdraw from their studies. We find that those students who are not able to pay for their studies have

academic difficulties and eventually withdraw from their studies. The financial sub-dimension is highly related to the parental and school sub-dimensions as well as the cognitive dimension. Students of lower socio-economic status who are more likely to be enrolled in poorer quality or government schools, are less prepared for university and are more likely to have poor achievement and have greater risk for withdrawal (Tinto, 1993). The financial sub-dimension did not have a significant relationship with risk for withdrawal, but emerged as a salient factor during the exit interviews.

The cognitive dimension, especially those related to academic achievement at high school, forms the base for the evaluations of cognitive ability. High school achievement is a measure of the cognitive preparedness of students and consists of content knowledge that Conley (2007) deems to be important for readiness. The key cognitive strategies discussed in Conley are a reflection of the abilities and skills that students have gained at high school. Other factors like the evaluation of the quality of the school environment also impact on perceived abilities and perceptions of preparedness for university. These factors subsequently influence perceptions of self-efficacy and locus of control as well as the goals that students will set for future performance. Locus of control is the perception of influence on the environment and has a direct influence on self-efficacy (Bean, 2005).

The cognitive dimension also includes the reading behaviour of students. Students who read for leisure or pleasure are more disengaged in the learning process, which leads to poor academic achievement.

The personal dimension consists of race (language) and gender. Race (language) played a significant role in predicting both risk for failure and risk for withdrawal. Race (language) represents the students' cultural background as it is expressed through language (Bandura, 1986). A language does not only indicate a difference in the words that are used, but also a difference in a 'meaning making system' and includes the values and beliefs or cultures associated with a specific language (Kuh & Love, 2000). The socio-cultural background of students also incorporates the domestic environment

where the students grew up and is extended in stereotypical behaviour due to socio-cultural influences and affiliations (Van Heerden, 1997).

Gender and racial differences influence the expectancies and values of students, their learning-efficacy judgements and goal orientations and their academic behaviours and choices. Subsequently it has a direct influence on academic achievement and withdrawal. The difference of the goal orientation and learning-efficacy scales among African and white students when predicting academic success confirms that cultural differences lead to differences in the way the non-cognitive factors are interpreted (Rodgers & Summers, 2008).

The non-cognitive factors are influenced by perceptions of personal past experiences, perceived academic ability, race, gender and socio-cultural influences (Wingfield and Eccles, 2000). The non-cognitive dimension represents the expectations and values of students and their self-efficacy judgements and goal orientations.

Goal orientation measured here consists of three related components, namely effort or academic apathy, planning of study time by setting goals, and being methodical in ones behaviour. The goal orientation scale confirmed the research that higher levels of effort and planning are positively related to academic achievement (Geiger & Cooper, 1995). The suggestion is that the components measured by goal orientation coincide with one of Conley's academic behaviours, namely study-skill behaviours. The study-skill behaviours compose of time management, which according to Conley (2007) refers to planning a task, setting up the study environment, breaking up the tasks into manageable chunks and balancing competing tasks. Goal orientation is regarded as short-term goals that are important regulators of behaviour, but dependent on the importance or value of the outcome as well as the expected success of achieving the outcome (Eccles & Wingfield, 2000).

Learning-efficacy consists of two main components, namely an internal locus of control (autonomy) and academic self-efficacy. Students with high scores on the learning-efficacy scale have the academic skills to be successful at university and have a general internal locus of control. The self-efficacy judgements indicate future expectations of task difficulty and the student's locus of causality. Efficacy expectations refer to an ability to do the task and do not indicate how well a person will do on the task (Zimmerman, 2000). Therefore, it is important for students to set task-specific goals that are able to enhance performance and effort. When a goal, especially a challenging goal, is attained it increases efficacy judgements and motivation to continue with the task. There is thus a cyclical effect between goals, self-efficacy and effort (see Perna & Thomas, 2008).

The results from this study indicate that the expectation of task difficulty and success together with the effort expended on a learning task is associated with academic success. Task value did not show a significant result and therefore contradicts the results of Geiger and Cooper (1995) that showed that the value of an outcome can be more motivational than the perceived expectation of attaining the outcome.

In summary, a reciprocal interaction is evident between the variables of the contextual, cognitive, non-cognitive and personal dimensions (Bandura, 1986; Bean & Eaton, 2000). These dimensions subsequently influence future expectations of task difficulty and the perceived value and cost of pursuing a degree at the institution. Expectations of success and task difficulty subsequently determine the learning-efficacy and goal orientation of the student, which lead to academic behaviours and choices. The academic behaviours in this model refer to students increasing their effort, being more methodical and planning their learning (Conley, 2007). The academic choices the students make relate to choosing a programme or career and the number of credits to register for.

The bureaucratic, academic, and social systems (institutional dimension) interact with the contextual dimension external to the institution, together with the other dimensions. The dimensions give an indication of the students who are more likely to be at risk for failure or withdrawal (behaviour that is being measured). Students that show a positive



non-cognitive dimension and who have the cognitive capabilities to excel academically and have a supportive contextual environment, will be more inclined to benefit from the academic environment and will be more likely to persist and achieve academically.

In addition, academic achievement has a high negative correlation with withdrawal behaviour, thus indicating that the higher a student's academic achievement, the lower the risk for withdrawal.

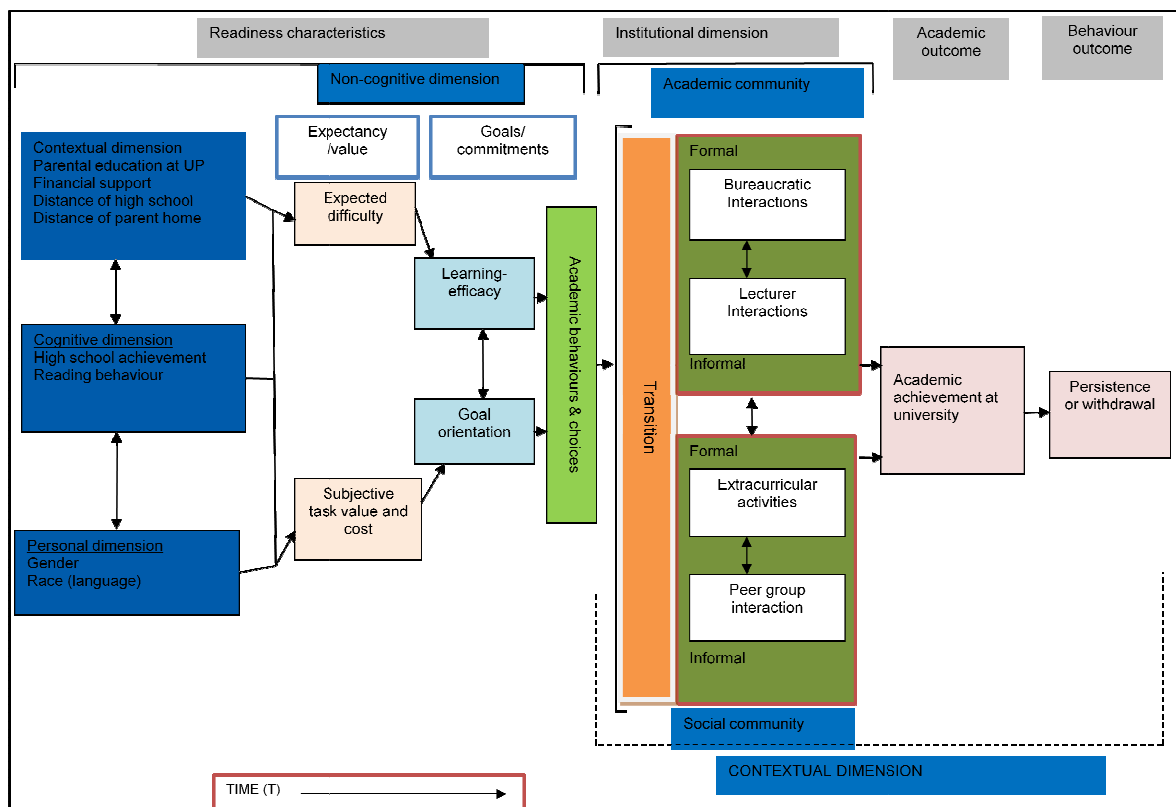


Figure 7.1. Model of readiness for university education

### 7.3. CONCLUDING REMARKS

The research set out to determine the readiness characteristics associated with important academic behaviours, namely academic achievement and persistence. Astin's (1970) model of student development in a higher education institution was used, most prominently the input – output relationship. The environment component was not measured during this study, to allow for the direct relationship between the readiness characteristics and the academic behaviours.

The use of a quantitative and qualitative methodology to measure the readiness characteristics allowed for additional variables to be included in the model and to test the research hypotheses, which were not assessed by the Academic Readiness Questionnaire.

The research results showed that African students have higher academic achievement and are less likely to withdraw, when compared to white students. This result is unexpected because it contradicts national trends and some of the findings of the literature. The literature of Rodgers and Summers (2008) and Sedlacek (2005) indicate that minority students, such as African-American students, are more likely to have poorer academic performance than white students when attending an HWI. Astin (1975, p. 143) indicates that African students attending an HWI are more likely to withdraw from their studies than African students attending Historically African Institutions.

The differences in academic success and withdrawal rates among African and white students are due to high school achievement and the number of credits the students register for. African students tend to register for fewer credits, with M-scores being equal. Registering for fewer credits should place the African students at risk, but this is not the case because some African students with average and high M-scores register for fewer credits. In the past, the African students tended to misjudge the workload of a university curriculum (Van Heerden, 1997). The results of the present study show that

successful African students in the sample are more cautious when registering for credits which are bearing positive fruits.

The academic achievement of African students allows for fewer students to be discontinued by the faculty and the results indicate that African students seldom withdraw voluntarily. Many African students have grade point averages below 50% which place them at risk for failure, but they still persist to the second year.

White students tend to register for more credits in comparison to African students with similar M-scores. Some white students' credit overload contributes to poorer academic achievement. The white students possibly feel pressure to complete their degree in the minimum duration. The research indicates that white students are more likely to withdraw voluntarily, mostly within the first couple of weeks or months mainly due to choosing the wrong study choice.

High school academic achievement is widely regarded as the best predictor of first-year academic achievement and has been confirmed by the study (Astin & Oseguera, 2005; Astin, 1975; Camara, 2005b; Sternberg & Grigorenko, 2002). M-score is a measure of high school achievement and represents the key cognitive strategies that are developed as part of the high school curriculum as well as the content knowledge that is achieved through the subjects taken at high school (Conley, 2005, 2007). The two elements interact with and affect one another extensively to such an extent that acquiring content knowledge is dependent on developing and using cognitive strategies. Content knowledge is formally measured by end-of-course exams at high schools and students who score high on these exams have higher M-scores. M-score therefore represents the academic preparedness of entering students.

M-score is a marginally stronger predictor in the case of white students than for African students on both risk for failure and withdrawal. The quality of schools and socio-economic circumstances of African students are some of the reasons given for this

difference (Jones et al., 2008; Scott, 2009). Tinto (1993) leans on other researchers to make a point that students of lower socio-economic status who are more likely to be enrolled in poorer quality or government schools are less prepared for university and are more likely to have poor achievement and have greater risk for withdrawal.

Goal orientation and learning-efficacy were predictive of risk for failure, but failed to show a significant relationship with withdrawal. Proposition 3 (Tinto, 1993), which specifically points to the direct relationship of goals and motivations with withdrawal behaviour could not be confirmed with the results. An indirect relationship was present due to the significant relationship between academic achievement and withdrawal in the first year.

Racial differences on both the goal orientation and learning-efficacy scales contributed to the decisions made by African and white students to register for their credit load. The evaluation of expected difficulty and ability specifically, together with contextual influences contributed to the decisions. African students have low to average goal orientation and learning-efficacy scores which could have contributed to their decision to take fewer credits, thus showing a negative relationship between the variables. The white students showed a positive relationship on both goal orientation and learning-efficacy, pointing to a possible reason for taking on a larger credit load.

Goal orientation, learning-efficacy and reading behaviour (three of the scales from the Academic Readiness Questionnaire) were significant predictors of academic achievement, but the correlation was lower than expected. Within the broader scope of academic success, academic achievement is but one factor (Camara, 2005; Perna & Thomas, 2008). It could be that the factors of the ARQ are associated with more of the facets of academic success, which are developed over the period that students are enrolled in the institution. High school achievement and the number of credits that students register for had a confounding effect on the ARQ scales which in turn influenced the scales' ability to predict risk for failure. The three scales therefore have an indirect effect on risk for failure and presumably also on risk for withdrawal. No evidence

could be found to indicate a relationship between risk for withdrawal and the factors of the ARQ which inhibits any conclusions to be drawn on possible relationships.

#### **7.4. CONTRIBUTION OF THE STUDY**

The study contributed to scientific knowledge by showing the readiness characteristics of first-year students that are related to risk at a South African tertiary institution. Racial differences relating to readiness characteristics are regarded as a very important contribution toward the readiness and retention models. Institutions do not always understand the entering student, nor do they know what the between and within-group differences are, if any. A scientific approach to measuring the readiness characteristics and producing risk profiles could contribute to improving the retention rates of an institution.

High school achievement measured with M-score will not be available from 2009, when the Admissions Point Score (APS) replaces it. The APS will be under investigation for a number of years until national norms are determined (Umalusi, 2009). Students entering the higher education sector during this period might not be selected accurately by universities, especially if selection is based on high school marks alone. Students are generally under or differently prepared which, contributes to the possible dilemma of universities (Scott et al., 2007). Non-cognitive and demographical elements should therefore be used to help identify students at risk.

A further contribution to scientific knowledge is the development of a concise measurement instrument from the theoretical foundation that can be used by faculty, firstly as a screening tool and secondly as part of an early warning system to determine 'risk'. The Academic Readiness Questionnaire proved to be a reliable screening instrument by giving an accurate measure of the non-cognitive readiness characteristics.

The ARQ showed somewhat disappointing predictive validity statistics, especially for African students.

According to Seidman (2005, p. 307), some students will not fit the profile of an at risk student at the beginning of the year, but present problems which affect the predictability of readiness characteristics in general. The use of the ARC as a screening test has the advantage of profiling students at risk, as opposed to absolute prediction of risk. It does not mean that students with a risk profile have no chance of success, but rather that they might encounter more challenges along their way in attaining success. The overall contribution of the ARQ is however recognised.

## **7.5. RECOMMENDATIONS**

Astin's (1970) model of student development in a higher education institution was used; most prominently the input – output relationship. The following broad recommendations can be made:

- The environment component should also be measured to determine how this component contributes to student outputs. The student learning experience (Upcraft et al., 2005), profiles of student engagement (Kuh et al., 2007) and development (Pascarella & Terenzini, 2005) can be measured when the learning component is added to the readiness and retention model. Including the environment component into an investigation could provide valuable information as to the process of development of students, from entry through to second year and eventual graduation.
- The second recommendation relates to a policy decision to measure readiness for university education as part of an early alert and referral system. Early alert refers to the identification of a student who is potentially at risk of being

unsuccessful at a university, either academically or personally (Beck & Davidson, 2001; Seidman, 2005). This could manifest at any point in the student's life cycle, albeit at registration for entry into a programme, at the first examination period or when students present with personal problems. To provide effective support, various sources of readiness information are necessary to profile students upon entry.

- Within the framework of an early alert and referral system, it is recommended that:
  - The ARQ be extended to include items that cover career exploration, general well-being, academic support needed, and anxiety levels during learning engagement and examinations.
  - The ARQ should also be administered to all first-year entering students enrolled at the institution. The purpose is to develop faculty-specific norm groups over time so that new entering students' profiles can be compared to the norm group to determine risk for withdrawal or failure. Each faculty should determine their risk profile and students should be short-listed based on the specific risk profiles. Additional questionnaires or interviews can follow the ARQ screening test to determine the extent of a problem or other contributing factors that influence the students' current risk profiles. These students can then be allocated to support services to address the specific needs of the students.
  - Students have to be identified as early as possible and their progress tracked. Continuous tracking of student performance becomes necessary because the ARQ can only be considered as a screening test for risk. Additional indicators, such as class attendance, poor academic achievement in tests or assignments should be indicators of early academic risk. A Learning Management System could also be used to place all biographical information of students into the database, together with the information of the ARQ and other ability or potential instruments to better inform the risk profile of students.
  - For an early alert and referral system to be effective in dealing with at risk student issues, support programmes have to capture the students (Jones, Coetzee, Bailey & Wickham, 2008). A contributing suggestion is to include

developmental programmes that support students on various levels (Sedlacek, 2004). The developmental implications refer to the long-term view that an institution should have to support students through their learning experiences, from entry through to graduation.

- Career advising and support should play an important role on campus and should be done in such a way that it gives information on students' abilities and how the abilities relate to the subjects they propose to enrol for, so that students can make informed academic decisions (Bean, 2005). Linking course decisions with possible job opportunities is also an important part of advising for career goals. Study choice questions need to be addressed in greater extent in future assessments when students enter. Strategic questions that assess career guidance were not included in the ARQ. The inclusion of such questions could have increased the validity of the instrument. According to Stage and Hossler (2004), searching and gathering of information about a programme and the institution is regarded as early indicators of students' motivation and involvement in their education, and has been linked to the academic success of students.
- According to Jones et al. (2008), under-resourced students are predominantly African students from rural environments. Grants or bursaries should therefore be given to under-resourced students to improve their ability to persist. The worldwide tendency on reduced public investment in higher education implies that, relatively speaking, universities are receiving less funding and can therefore not provide bursaries to students to cover all their educational needs (Cloete et al., 2006). The lack of funding will therefore have an influence on institutional retention rates and student persistence rates specifically.
- The credit load of students and its relation to both risk for failure and withdrawal has implications for curriculum development. The debate regarding the implementation of extended programmes is a point of discussion on various higher education societies and interest groups, such as the Higher Education Learning and Teaching Association of South Africa (Young & Scott, 2009). The research findings do not argue for or against extended programmes in South



African universities, because registering for the prescribed number of programme credits is positively associated with academic achievement and persistence. A trend from African students indicates that registering for fewer credits can be advantageous. African students consciously register for fewer credits and are successful at first year. White students do not have the same successes when registering for fewer credits over the first year.

- The finding that African students progressively have higher withdrawal rates than white students from second year registration indicates that lowering the number of credits only does not serve in the best interest of the students. The recommendation is to not only lower the credit load, but also implement developmental programmes. Students from these programmes should be supported in such a way that they are able to make a transition to mainstream in the second or third year. This transition should be gradual with high support with many developmental programmes in the beginning of the first year with less support toward the end of the extended programme.