

# A selective review of studies of quantitative evaluations in education

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## Abstract:

There are many interventions in educational systems around the world designed to help disadvantaged or underperforming groups. Quantitative analyses of the effectiveness of these interventions are not as common. Nonetheless there is now a substantial research literature measuring the impact of programs aimed at increasing progression to -or retention at - higher education as well as other outcomes such as exam performance. This paper is a review of selected studies from that literature. We distinguish between merit-based and needs-based financial aid as well as other forms of support. It is shown that careful use of statistical and econometric methods reveal that some but not all interventions can have significant benefits for the target groups.

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## **1.1 Introduction**

It has long been recognised that the rate of return for individuals who invest in higher level education is high, however, not all groups in society invest equally in third level education despite much effort in recent decades to increase the participation and completion rates of students from underrepresented backgrounds.

Many states have implemented policies which aim to promote 'equality of opportunity' for students from disadvantaged backgrounds who aim to participate in higher level education. Universities have established access programmes that are designed to boost enrolment and retention of these groups. However the effectiveness of these programmes needs to be examined in more detail to understand why underrepresentation, withdrawal and non completion remain enduring problems.

In describing the effectiveness of access programmes best practice we are focused on several key areas of research, namely access/entry/progression (to college), retention, exam performance, withdrawal/non completion and graduation. Apart from the terms 'access' and 'entry/enrolment' which can be considered inputs, these different terms can be placed under the heading of the outcomes of entry to college. Interventions and access initiatives seek to influence these inputs and outcomes. Each of these terms needs to be defined in order to appreciate the different strategies that are employed in dealing with access and retention, not only for students from disadvantaged backgrounds, but also for the student body in general.

Many access initiatives aim to affect the outcomes mentioned above. They focus on tackling the barriers to access and in particular tackling financial barriers to higher level education. For this reason there is a large quantity of literature that concentrates on financial aid. There are two types of scholarship/aid programmes: needs based and non-needs based. Yet, there has been a growing recognition that tackling financial constraints alone does not necessarily lead to better access to higher level institutions, therefore more research is being conducted on the affect of programmes designed to tackle the academic, social and cultural constraints to accessing post second level education.

Not all financial aid programmes are designed specifically to assist students from under-represented groups to participate in college. Merit based aid is intended to encourage good performance from students while also boosting enrolment rates. However, the primary beneficiaries of such aid are often students who would be attending university regardless of the offer of aid. Such students are typically not members of groups that are traditionally under-represented. According to Cornwell et al. 2005 the primary beneficiaries of Georgia's Helping Outstanding Pupils Educationally (HOPE) programme, a merit-based scholarship that is used as a model for merit aid in many states, are students from white middle income backgrounds.

The aim of this paper is to explore the effectiveness of access programmes using international evidence of best practice<sup>1</sup>. Note that Skilbeck and O'Connell (2000) caution that when drawing general conclusions for future action on the basis of

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<sup>1</sup> Deming & Dynarski (2009) provide a comprehensive survey of recent US research on policies to increase the educational attainment of the poor.

“*international good practice*” one must be aware that comparative analysis is difficult due to the lack of evaluation research on the impact of established policies and programmes. Section 1 of this paper focuses on defining what is meant by ‘access’ in literature on the subject while section 2 focuses on how progression, retention and withdrawal are defined and examined in the literature. Section 3 and 4 examines the literature on financial aid. In particular we will focus on the impact of merit-based aid and needs-based aid on progression, retention, exam performance and completion. Section 5 then focuses on evaluations of programmes designed to aid student progression by tackling educational or social/cultural barriers and finally section 6 concludes.

## **1.2 Defining the ‘access’ question: examining how the literature tackles the evaluation of access programmes**

When examining evaluations of access programmes the transition from second level to third level provides a convenient demarcation of where the definition of access changes from ‘enrolment’ to ‘retention’. Some evaluations study the effects of pre-entry programmes which focus on getting students into college while others focus on interventions aimed at post-entry retention and completion.

There is a wealth of studies on the causes of low participation and entry rates by certain disadvantaged groups. This research highlights the importance of parental education, social integration, individual characteristics and institutional factors which can influence a student's entry to and persistence in higher level education (Tinto, 1987) however in general, evaluations of access programmes have until recently focused on the financial barriers to post secondary education (PSE). Evaluations have also tended to focus on programmes designed to boost exam performance for students who are struggling with their university course.

Access programmes that aim to tackle social and cultural barriers to higher level education are becoming more prominent and subsequently evaluations of these programmes are evolving. These programmes focus on tackling the multi-dimensional nature of access through the provision of tuition, mentoring programmes, orientations and cultural support as well as providing financial aid. One such evaluation is “*Lead them to water and pay them to drink*” and one of the central focuses of Finnie et al. (2008) is to identify how much of the access(enrolment) gap is related to financial factors and how much is explained by other influences (preparation, choice, etc.) with which family incomes is correlated.

According to Finnie et al. (2008) research and debate about access to PSE are moving, towards recognition of the importance of the non-financial factors. They point out that “*Access issues from this broader perspective are conceptually and empirically complex*”. Yet much policy and many policy debates are focused on money and on affordability in particular.

## **1.3 Defining access - a brief overview of policy objectives**

It is important to examine policy objectives when discussing best practice in access. Not only are access programmes, initiatives and interventions influenced by what are considered the main barriers to higher level education but they are also directly influenced by the policy goals and objectives of higher level institutions and equality objectives on an international level. It is stated in ‘*Power, Points and Privilege*’ (2003) that access is defined by the European council as ‘*the widening of participation in*

*good quality higher education to all sectors of society; the extension of participation to include currently under-represented groups; and a recognition that participation extends beyond entry to successful completion* (Council of Europe, 1999: 3). This definition serves as a good indication of policy objectives in relation to ‘access’ to higher level education.

According to Skilbeck and O’Connell (2000) ‘equity’ is the key principal or organising term placed on access. However not all programmes designed to give students access to higher level education may be equitable, as can be the case with non-needs based merit scholarships. Skilbeck and O’Connell focus on the education equity chain, and outline a framework of objectives for promoting equity in higher level education at the institutional level. The education equity chain is based on the argument that in order to make further equity gains in higher education, different kinds of actions are required at all levels of the education system and in the wider society in order to improve access to higher level education. In other words, education institutions need to work more directly beyond their own immediate boundaries. Criteria for promoting equity includes fostering consciousness of discrimination and inequality practice and ensuring appropriate access arrangements for underrepresented groups.

Recommendations on how this can be achieved includes the provision of bridging courses, study programmes, tuition guidance, flexible assessment practices, welcome entry arrangements, financial and other support to meet the needs of members of underrepresented groups, establishing appropriate staffing structures and monitoring and evaluation.

They also call for the integration of policy relating to under-represented groups into all aspects of the institution and ensuring that these groups’ views are represented in planning and decision making. According to Finnie et al. (2008) constructing access in its broader sense i.e. not just in terms of financial barriers to higher level education, has fundamental policy implications. If differences in access among different socio-economic groups are primarily a matter of money then policy solutions would lie in the realm of financial aid. However if it is accepted that access is more related to information preferences, preparation and other factors then interventions should follow these dimensions as well. They summarise by stating “*in short if our notion of barriers is wide, then so too should be the range of policy tools under consideration*”.

#### **1.4 Defining access: barriers to higher level education**

In practice most access programmes operate by tackling barriers to higher level education. Therefore, no discussion of access and retention in relation to socio-economically disadvantaged students is complete without a discussion of these barriers. The perceived importance of different barriers will determine the type of access programmes implemented to tackle educational disadvantage. If the barriers are perceived to be financial in nature than support for students trying to access higher level will take the form of financial aid. However if other factors such as the quality of second level education received, student preferences or social values and norms are perceived to be influential in the decision to enter university, then access programmes must aim to address these barriers through broader programmes involving non-financial supports.

Finnie et al. (2008) state that many discussions of access focus on barriers that block individuals entering PSE or obstruct them from continuing once they have started. However they claims the term “ *‘barriers’ is often poorly defined and not placed in the broader context necessary for addressing the full set of relevant issues from a conceptual, empirical, or policy perspective*”.

As well as financial barriers to higher education, there are what they terms “*softer barriers*” which are related to family background such as individuals not being sufficiently prepared for PSE or a lack of information regarding the costs and benefits of higher education. They argues that *‘These barriers follow from interaction between an individual’s environment and the choices he or she makes over long periods of time’*. They points to a previous study where he finds that many early-in-life outcomes that are correlated with family background are also predictors of post-secondary access (Finnie, Lascelles, and Sweetman, 2005). Therefore it is concluded it is not just financial barriers that are important when discussing the cause of low participation and enrolment rates, but also *‘preparation’* barriers (academic or otherwise) and *‘interest’* barriers.

### **1.5 Defining access: financial aid**

There are several different types of financial aid. Two of the main types of financial aid include needs based aid in the form of grants and merit-based scholarships. Eligibility for needs based aid is based on certain criteria, such as means testing, and often takes the form of a grant. The aim is to boost the enrolment of students from lower income families who have the ability and inclination to partake in higher level education yet may not be able to meet the costs associated with attending university.

Merit-based scholarships are not necessarily based on income levels. To qualify one must achieve or maintain a certain grade in either pre-entry and post-entry exams. Merit-based aid is designed mostly as an incentive for students to boost exam performance or in the case of the Georgia HOPE (Helping Outstanding Pupils Educationally) programme to attend university in their home state. According to Cornwell et al. (2001) *‘States have justified “HOPE-style” scholarships as a means to increasing college enrolment, keep their best high school graduates in state for college and promote academic achievement’*

Evaluations of the HOPE programme have concentrated on the effectiveness of merit aid and also on any effects it may have on access or student behaviour. According to Cornwell et al (2001) HOPE boosted both black and white enrolment by 5.9% between 1988-97 but the majority of students who take up the HOPE scholarship are white/middle income families.

## **2. Inputs and Outcomes**

### **2.1 Introduction**

This section focuses on defining the terms used in the literature on access to higher level education and on the theoretical approaches used to explore these areas. These terms include widening participation/enrolment, retention/persistence/completion and withdrawal/non completion. Often these terms can be used almost interchangeably but there can be subtle differences between them, for example, the difference between retention and persistence can be seen as responsibly being placed on the student in that the student decides to persist in one instance and in the other instance the responsibility lies with the university in that it retains its students.

### **2.2 'Pre-entry' widening participation/enrolment/progression**

When reviewing the literature on the evaluations of access programmes studies focusing on 'participation', 'progression to', 'entry' and 'enrolment' can fall under the heading of *pre-entry access*, as it involves students generally getting through the door of a higher education institution and are inputs to higher level education in general.

Perna (2002) identifies three theoretical approaches used to explore the factors underlying observed differences in college enrolment as outlined by Hossler et al. 1989. These theoretical approaches include economic models, sociological attainment models and information gathering models which combine the latter two. Economic models hypothesize that, based on an individual's tastes and preferences; they will make a decision about attending college by comparing the benefits with the costs for all possible alternatives and then selecting the alternative with greatest net benefit. Sociological attainment models emphasize the influence of interactions with family, peers and school environments as effecting decisions to enrol in higher level education. According to Perna (2002) the third conceptual framework combines the assumptions of the economic and sociological approach. This approach focuses on information processing and gathering. One of the most commonly used approaches to understanding college enrolment is the three-stage framework that Hossler and Gallagher (1987) proposed. Potential students go through three stages before they enter higher level. Firstly, they become predisposed towards college, secondly, they gather information on courses and colleges, and finally, they choose an institution to attend based on a 'rating or ranking of each one'.

In addition, some researchers have drawn upon the concept of social capital to explain differences in personal preferences and tastes in an econometric model. 'Social capital' can be described as non-monetary resources that one can avail of when making decisions or in perusing goods and services. Social capital may take the form of social networks, information sharing or social norms, values and expected behaviours and is beneficial to students both before and after entry to university. Through social networks, information can be shared on the costs and benefits of higher level education and shared social norms, values and expected behaviours makes it easier for students to meet like-minded individuals.

According to Perna 'social capital' may be passed on via parents or acquired through peers. Different socio-economic groups have different forms of social capital. Parents

who have been to university can pass on information to their children about college life and may also expect their child to attend university whereas no such information or expectations may exist for children whose parents have no experience of higher level education.

When examining the influence of social capital on higher level education one recommendation is that information sharing to groups who are traditionally underrepresented at university can be seen as one way of tackling barriers to accessing higher level education.

### **2.3 'Post entry' retention/completion/persistence**

The terms 'retention', 'persistence' and 'completion' and progression (beyond first year) can be generally defined as students continuing with a course after entry (post entry) to university up to and including graduation and can be considered outputs of higher level education. According to Van Stolk et al. (2007) "*It is challenging to make comparisons between retention rates of countries given the differences in how retention and completion rates are defined and calculated*". Countries often measure completion or graduation differently. Retention rates are measured by the OECD in terms of degree completion<sup>2</sup>, graduation<sup>3</sup>, and survival rates<sup>4</sup>.

According to Mangold et al. (2002), research on student persistence generally adopts one of several theoretical perspectives: economic, interactional, organisational, psychological and sociological and has focused on four key themes. These themes centre on the examination of relationship between student precollege characteristics and their success in college, the causes of student attrition and the provision of recommendations to reduce withdrawal, describing and evaluating programs and improved teaching techniques and their relationship to student retention.

A number of studies have looked at the effectiveness of developmental programmes on student retention. According Lesik (2007) "Developmental educational programmes have been in existence since the beginning of the higher education movement in America ...The purpose of these programmes are to help academically underprepared students with the college curriculum and thereby increase retention. Lesik states that a recent review of the literature have shown that little improvement has been made in adequately assessing these programmes and that "only a small percentage (of two-and 4 year colleges and universities) conducted any systematic evaluation of their redial (or developmental) education programs" (The Institute for Higher Education, 1998, p. 10).

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<sup>2</sup> The number of degrees awarded per 100 students enrolled in a given year (OECD).

<sup>3</sup> The ratio of tertiary graduates to the population at the typical age of graduation, multiplied by 100 (OECD).

<sup>4</sup> The number of graduates divided by the number of new entrants in the typical year of entrance (OECD).

## 2.4 'Post entry' withdrawal/non-completion

Withdrawal as a term brings about a number of problems when evaluating the effectiveness of access programmes. Students may 'drop out' or withdraw from a college course completely or alternatively they may '*stop out*'<sup>5</sup> which means they leave for a period of time and return. In addition, withdrawn students may also re-enter higher level at a different university.

According to Morgan et al. (2001), research in North America into non-completion has contemplated the role of individual factors, institutional factors and also of social interactions for example student staff interaction. Individual factors can include demographic characteristics, personality, age, gender, ability/achievement, preferences and expectations. Institutional factors can include criteria such as selectivity and size). Social interactions can include the students level of engagement with the university community.

Murtaugh (1999) points out that pre-college characteristics do not explain all of the variation in student attrition. Numerous studies have found that students are more likely to stay in university when they are actively involved in campus activities and feel a sense of community in the institution (Astin, 1993; Tinto, 1993; Naretto, 1995). For this reason, support programmes to increase students' feeling of connection to the institution have been introduced at many third level institutes. In particular, the greatest risk of withdrawal occurs during the transition from the first year of study to the second year and for that reason many programmes focus on first year students

As regards the UK experience three primary causes of withdrawal among full time students identified by Yorke (1999) include: firstly financial difficulties, secondly a mismatch between students and their choice of field of study, and finally a poor quality student experience (in Patrick, W. J. 2001)

In a British context, Hazel et al. (2004) explains that there are two broad approaches that merit attention in relation to withdrawal. The first attributes non-completion to expansion of the higher level education system, and the second can be attributed to a lack of support services in higher level institutions (Blythman & Orr, 2002 in Hazel et al.(2004)). The paper states that a third explanation for non completion focuses on changes in the funding arrangements, particularly the funding of living costs from familial contributions and or student loans. The increased cost that students now face arguably creates most difficulty for students from less affluent backgrounds.

The expansion of higher level education may be attributed to higher non-completion rates as students who enter university with non-standard qualifications and lower grades may be more likely to withdraw. In this case non-completion is blamed on the attributes of the students, who are regarded as being poorly prepared for higher education and/or lacking in motivation and ability (Wright, 1996)in Hazel et al. 2004.) The alternative approach focuses the blame on universities for failing to put into place inclusive policies and additional support services needed to help all students achieve their potential.

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<sup>5</sup> Bettinger, E. (2004) 'How financial aid affects persistence' Working paper National Bureau of Economic Research.

## 2.5 Conclusion

When reviewing the literature on the evaluations of access programmes studies focusing on ‘participation’, ‘entry’ and ‘enrolment’ can fall under the heading of *pre-entry access* whereas evaluations focusing on retention completion exam performance and withdrawal can fall under the heading of post-entry access. There are several fields of research generally employed when examining ‘access’ to higher level including economic models, sociological and psychological perspectives. The concept of social capital as a theoretical framework also has a following in examining access to higher level education. Research into access, student retention, persistence and withdrawal also focuses on the contribution of individual factors such as personality, the characteristics and preferences of individuals and their motivations, institutional factors such as the access policy, financial aid and the friendliness of higher level institutions and social engagement such as how well a student adjusts to their new environment, their peer networks in college and their contact with staff. Responsibility for withdrawal has also been laid at the feet of the expansion of higher level education to include students who may not be academically prepared. Academic preparation and school resources may also be considered by the literature as important in examining the readiness of students to enter third level education.

### **3. The effectiveness of merit based financial aid**

#### **3.1 Introduction**

There are several different types of financial aid programmes. One type of financial aid is merit-based scholarships. Merit-based scholarships are not aimed at any specific target group, however they are subject to eligibility rules, such that a student must obtain and/or keep better grades.

Cornwell et al. (2005) state that one of the justifications for the introduction of merit based scholarships like the 'HOPE' (Helping Outstanding Pupils Educationally) scholarship is that they are designed to promote academic achievement through encouraging a variety of grade-enhancing behavioural responses such as students increasing their effort or concentrating more on school work rather than paid work.

However they also argue that the scholarship can bring about unintended behavioural responses by acting as an incentive to reduce course loads and avoiding difficult classes in order to maintain a high Grade Point Average (GPA).

#### **3.2 Merit based aid: progression**

Cornwell et al. (2006) study the effect of the HOPE programme on enrolments in Georgia colleges and universities in the US. The HOPE scholarship is a merit based scholarship programme that is not limited by means testing. The HOPE scholarship is funded by a state lottery and covers tuition, fees and book expenses for students attending Georgia public colleges and provides a subsidy of comparable value to students attending in state private colleges. To be eligible, a student must have graduated from a Georgia high school with a "B" average and there are no income restrictions. The HOPE programme also includes a HOPE grant which according to Cronwell has no income or merit restrictions and can be applied only to non-degree programs at 2 year schools.

The paper contrasts first time freshmen enrolments in Georgia institutions with those in control-group states before and after the HOPE programme was introduced. They find that HOPE raised the total freshman enrolment rate in Georgia colleges by 5.9% or 2889 students compared to other *Southern Regional Education Boards* (SREB).

However this estimated annual enrolment increase represents only 15% of freshman scholarship receipts from 1993-1997(including grant recipients). The total enrolment affect is greatest in 4 year schools, while the programme effect estimates for 2 year schools (which accepts the HOPE grant) are small, negative and statistically insignificant. Hope induced enrolment increases of 9% in 4 year public schools and 13% in 4 year private schools were observed.

The enrolment responses of black students are larger than white students, with a greater effect in 4 year public colleges and evidence of a program response in technical school enrolment. This may be seen as evidence that the HOPE programme helps ethnic minorities, however it may be partially explained by a large number of large historically black colleges and universities (HBCU) However the results show

evidence of a significant rise in the black share of total (white and black) enrolment (2.7 percentage points).

Overall Cornwell et al.(2006) conclude that the effect of the programme is that it changes the composition of students who leave their home State to study. Georgia's rate of retaining students with SAT scores greater than 1500 climbed threefold. Cornwell et al. (2006) speculates that programmes like HOPE primarily affect the choice of where, rather than whether, to attend college and call into question the social benefits of state sponsored merit aid in that the gain in student quality in Georgia may be offset by declines elsewhere as high achieving Georgians stay in their home state.

### **3.3 Merit based scholarship retention rules: unintended consequences**

Cornwell et al. (2005) examine student responses to merit scholarship retention rules. Using non-residents of Georgia as a control group, the paper examines grade attainment and the course taking behaviour of students receiving a HOPE scholarship between 1989 and 1997.

In order to be eligible to retain a HOPE scholarship a student must maintain a 3.0 GPA at three different GPA checkpoints. The HOPE programme is based at the University of Georgia (UGA) and a full course load for an academic year at UGA was considered to be 45 credit hours. The GPA checkpoints occurred at the 45, 90, and 135 credit hours. If a student loses eligibility then they may regain the scholarship if they achieve a 3.0GPA before the next checkpoint.

The paper examines three possible unintended behavioural responses. One response is that students will enrol in fewer courses at the start of term as this guarantees an extra term of funding by forestalling the HOPE checkpoint. Secondly, a student can withdraw from classes when not performing well to preserve their GPA as withdrawn classes do not enter GPA calculation. A third response is to choose classes where the expected grade is higher or defer course work to the summer when grade distribution is significantly more generous. From 1989-92 GPA average in summer was 2.89 compared with 2.57 in the autumn and this gap widened after HOPE.

Between 1993 and 1997 the rate of resident first year students taking a full course load fell from 82% to 69%, while the rate of non-resident students taking a full course load stayed consistent at 80% or above. This is indicative of a behavioural response induced by the scholarship programme. The findings also suggest that HOPE students withdrew from courses much more frequently than non-resident students. Overall the paper concludes that the combined effect of these responses is that after the introduction of HOPE, there was a decline of 24% in the full course load completion rate of resident students.

### **3.4 Conclusion**

Overall Cornwell and colleagues find that merit based financial aid is effective in that it increases the enrolment of new entrants by 5.9%. However this only makes up about 15% of all scholarship recipients. They conclude that overall merit aid affects

'where' rather than 'if' a student goes to college. They also find that while merit aid can increase grades due to retention rules, it also encourages unintended behavioural responses such as attending fewer courses, and avoiding or dropping difficult courses in order to keep the required GPA.

## **4. The effectiveness of needs based financial aid**

### **4.1 Introduction**

Needs based financial aid is designed to improve the enrolment, retention and graduation rates of students from socio-economic or minority groups that are often under-represented in higher level education. Eligibility for needs based aid is often strictly controlled and students need to fit a specific set of criteria in order to be considered. One of the most important factors for socio-economically disadvantaged students is means testing. This section presents four evaluations of needs based financial aid initiatives in the US in order to tentatively gauge the effectiveness of this type of aid on progression, retention and exam performance.

### **4.2 Needs based aid: progression**

Dynarski (2003) studies the effect of student financial aid in the United States. From 1965 to 1982 the Social Security Administration gave financial aid to the children of deceased Social Security beneficiaries. This programme was cancelled in 1981. The paper uses this “natural experiment” to see what subsequently happened to college attendance in 1982. Eligibility for this aid depended on the earnings history of the parent whose death had generated the Social Security payments, hence this is a means tested benefit. The financial aid provided was relatively generous. The average in 1980 was \$6,700, which was much bigger than the average needs based grant provided by the US government under the Pell Grant scheme (\$2000). Tuition costs at private universities were of the order of \$7,100 at the time.

The paper uses the difference-in-differences method to evaluate the effectiveness of the policy. Several outcomes are considered, whether a person attended college full-time, whether they completed any years of college and the number of years of education completed. The evidence is that aid eligibility increases progression to college (as well as retention as discussed in section 4.3 below). For example, aid eligibility is estimated to increase the probability of attending college by 22.4 percentage points. It is estimated that a reduction in education costs for an individual of 10% will increase attendance by about 15%. Whether these results generalize to the effects of aid in general is unclear since the population studied are unique on one respect: in all cases their father is dead. Nonetheless it seems clear that for at least some individuals, financial aid is an effective way of increasing participation in higher education.

Mc Pherson and Schapiro (1991) study the effects of needs based aid in the form of the Pell Grant on college enrolment. They note that total federal spending on needs based grants to undergraduate students accounted for less than 3% of total tuition revenue before the introduction of the Basic Educational Opportunity Grant program in 1974 (later renamed Pell), and 29% of the total tuition revenue to U.S. colleges and universities in 1980. Federally subsidized loans for institutions grew from around \$3 billion to over \$5.5 billion 1982 dollars over the same period of time. However despite this change in financial aid, enrolment rates remained unchanged or dropped during this period

Their analysis using individual level data aggregated to groups so an individual data point would refer, for example, to white women, incomes below a certain level in a particular year. The data covers the period 1974-1984 so it, uses changes over time in net cost of enrolment to explain the average college enrolment rates across public and private institutions. The paper only examines evidence from low income white students as the sample population of other ethnic minorities were too small to allow time series analysis at the level of disaggregation the authors employ. As a result, the sample size is fairly small, n=66.

The evidence suggests that for lower-income students, a \$100 net-cost increase results in an enrolment decline of about 0.68% points which is about a 2.2% decline<sup>6</sup>. However the findings also suggests that, not only does an increase in net cost have no effect on the enrolment behaviour of more affluent students, but that an increase in net cost had a positive effect on enrolment for this group. According to McPherson and Schapiro this result may be explained by supply, rather than demand, as a strong demand among middle- and upper-income students for higher education could cause colleges and universities to raise their prices.

#### **4.3. Needs based aid: retention/completion /persistence**

Bettinger (2004) examines the effect of needs based aid in the form of the Pell Grant on the retention rates of students from under represented backgrounds in the United States. The Pell Grant programme is the largest needs-based financial assistance programme available to students aiming to attend third level education in the USA. The Pell Grant programme was introduced in 1965 and is based on means testing.

The paper exploits differences in the amount of aid paid to students over time to estimate the effect of the grant. One of the reasons as to why an individual's grant may change from year to year is the generosity of the grant may change, tuition fees may change and there may be a systematic change in the formula for calculating eligibility.

The results of this paper find a positive relationship between student financial aid and students' persistence in university. However, the size of the positive effect of aid on persistence varies depending on the estimation procedure used. The author notes that the results concentrate only on retention from first to second year of college in consecutive years, and not on any longer term effects.

The paper by Dynarski (2003) discussed above also considers retention and completion and finds that aid appears to entice into college about 22 percent of students eligible for entry that would not otherwise have entered. While many of these marginal entrants will complete just a few years of college, aid likely induces others who would have completed just a few years of college to instead finish their degrees. The effect of movement along these margins is a relative increase by age 28 in average schooling of 0.679 years. Adjusting for classification error this estimate moves upwards to 0.754. However, in a subsequent paper, Dynarski (2008) comments

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<sup>6</sup> The authors state, however, that it is unclear to what extent federal aid affects the net cost of college attendance. They note that certain evidence has shown that the net costs of college attendance for low income students is generally lower during periods when the level of financial aid is high, but that the effect of aid on the net cost of college attendance needs to be explored in greater detail.

on the results of the 2003 paper and states that the impact of discontinuing the Social Security benefit programme on schooling was “imprecisely estimated”.

Brock et al (2003) studies the impact of a performance based top up scholarship implemented at two Louisianan third level institutions and found a positive impact on retention in the form of an 18 and 11.2 percentage point higher rate of registration in college in the second and third semester respectively amongst low income parents participating on the open doors programme.

#### **4.4 Needs based aid: exam performance**

The paper by Brock (2006) examines the effect of a Louisiana scholarship programme (the ‘Opening Doors Program’) for low income parents attending Delgado Community College and Louisiana Technical College in New Orleans to determine whether it has an effect on course completion and exam performance. The evaluation also aimed to examine the long term influences of the initiative on student’s employment, earnings, health and other measures of personal and social well being, however this was interrupted by Hurricane Katrina in 2005.

The Opening Doors programme provided a top-up merit based scholarship which offered students a \$1000 scholarship for each of the two semesters (\$2000 in total) as an incentive to maintain a C (2.0) average and at least half time enrolment. The scholarship was provided on top of any other grant or scholarship the student held. The programme also offered counselling services, which focused on ensuring that students were enrolled at least half time and earning passing grades however these were offered to both treatment and control albeit the treatment received more intense support. In order to qualify for the programme, students had to be aged between 18-34, be a parent of at least one dependent child under the age of 19, have a family income below 200 percent of the federal poverty level, have a high school diploma or General Educational Development GED certificate, have a passing score on a college entrance exam, and have no degree or occupational certificate from an accredited college or university.

In relation to exam results the paper finds that the treatment group passed more courses and earned more credits. On average after one semester students in the program group earned on the order of 1.1 credits more than the control group. This result is made up of both regular and developmental program credits and is significant at the 1% confidence interval level. The treatment group was 12.4% more likely to pass attempted courses than the comparison group and 13.1% more likely to pass all courses.

#### **4.5 Conclusion**

In conclusion, needs based aid is effective in increasing both enrolment and retention. Mcpherson and Schapiro (1991) find evidence that increases in tuition costs impact negatively on enrolment among students from lower-income backgrounds. Bettinger’s (2004) study concludes that increases in the net cost of attendance have a negative and statistically significant effect on enrolment for white students from low income families and found no evidence that increases in net cost inhibited enrolment in more affluent income groups. Dynarski finds that aid eligibility increases the probability of attending college by 22.4 percentage points. Brock et al. (2006) finds that full time

enrolment is 8.9 percent higher in the programme group than in the control group, the treatment group passed more courses and earned more credits and they had an 18% higher rate of registration in college in the second semester.

However, whether or not Dynarski's (2003) results and the results of Brock et al (2006) can be generalized to the effects of aid in general is unclear since the populations studied are unique; in one case a parent has passed away and in the other, all participants are lone parents.

## **5. The effectiveness of educational/social support**

### **5.1 Introduction**

More recently, needs based financial aid is being coupled with other forms of aid such as outreach and intervention programmes that aim to influence access and retention. Perna (2002) highlights that policymakers, recognising the limits of financial aid, have recently focused greater attention on pre college outreach programmes as an alternative to raising college enrolment rates. According to Van Stolk et al.(1987) Many Access initiatives reflect on the work undertaken by Tinto on the importance of 'academic and social integration' of students in Higher Level Education. Studies of the effectiveness of these initiatives also reflect the importance of these factors.

A more recent study by Dynarski (2008) looking at the causal impact of college cost and degree completion finds that two state merit aid scholarship programmes increases the share of the exposed population with a college degree by three percentage points, with stronger effects among women. However even with the offer of free tuition, many students continue to drop out, suggesting tuition costs are not the only impediment to college completion.

This section of the paper examines the aims and effectiveness of outreach programmes through an evaluation of the EXCEL programme. Secondly, it examines academic support in the form of a developmental maths programmes and social support in the form of a block registration and mentoring programme. Finally, it examines the effectiveness of a programme that combines financial and social support as opposed to providing one type or the other.

### **5.2 Outreach programme: progression, personality and exam performance**

Bergin et al. (2007) study the effects of the EXCEL outreach programme on the progression to university of students from groups that are under-represented in higher level education. The EXCEL programme is a comprehensive pre-college access intervention that includes all the key components of model access programme as identified by Perna (2002). These include college awareness, parental support, academic support, financial support and early intervention. The programme involves eligible students completing a college preparatory curriculum, maintaining a B average in high school, participating in programme activities and achieving a score of 18 on the ACT. If these components are successfully completed the student then receives a scholarship to university. To be eligible for the programme students needed a B average, at least 8<sup>th</sup> grade level standardized scores and a recommendation from a school counsellors who nominated eligible students from under-represented groups. Level of income was not eligibility criterion.

The effectiveness of the programme was evaluated using an experimental design in which eligible students were randomly assigned to a treatment (43 students) and control group (40 students), stratified for achievement level gender and ethnicity. Bergin et al. (2007) focus on several key outcomes. First, whether the EXCEL

programme participants were more likely to enrol in the sponsoring university or a non-sponsoring university than the control group. Second, if the EXCEL students had a higher GPA, higher self esteem and a greater desire to attend college than the control group. And finally, the study addressed whether the highest achievers in 8<sup>th</sup> grade were more likely to enrol in higher education than the average achiever.

The programme showed an effect of increasing the enrolment rates of minority students at the sponsoring university, however there was no statistical difference between the treatment and control group in terms of enrolment in higher education i.e non-sponsoring universities. In addition, the programme did not have a significant effect on the EXCEL students self esteem or high school cumulative GPA. However an effect was identified in terms of increasing the desire for education. Finally, no significant programme effects were found for students with differing levels of achievement.

In sum the EXCEL programme, which adopts a more holistic approach compared to financial based access programme, has some positive effects on progression and the desire for education, yet fails to have an impact on the academic achievement of the students or their self-esteem.

### **5.3 A developmental mathematics programme: withdrawal**

Lesik (2006) evaluates the effectiveness of a developmental mathematics programme in a US state university on withdrawal rates using a regression discontinuity design. The causal impact of the programme is determined by comparing students who are assigned to the programme using a cut-off point of 125 on a mathematics placement exam. Students scoring below 125 are assigned to the programme while those scoring above 125 are not eligible. The causal effects of the programme are estimated by comparing the withdrawal rates of students with results just above and just below the cut-off level. The RDD estimation procedure assumes that these students are, on average, identical in all aspects other than treatment status. Lesik also adopts a discrete-time survival analysis which estimates the time-to-dropout using a hazard probability which indicates the probability a student will drop out during a particular semester.

Overall, the study finds that the developmental mathematics programme has a positive effect on retention rates. The estimated risk of withdrawal after first year is 8.2% for students who participate in the programme, while equivalent students who did not participate in the developmental program have an estimated risk of dropout of 27.7%. After the second year, participants had an estimated risk of drop out of 4.4% while students in eth control group had an estimated risk of 16.5%. In terms of the survival function, 88.7% of participants survived (i.e. did not drop-out) compared to 62.7% of non-participants after the 1<sup>st</sup> year, and 81% of participant survived compared to 43.4% of non participants after the second year. Finally, the analysis shows that students who did not participate in the mathematics programme were 4.3 times more likely to drop-out over the first three years, compared to programme participants. In sum, developmental programmes can play a role in improving retention rates for at-risk students.

## **5.4 Social supports: retention, exam performance and graduation**

Mangold et al. (2002) study the effect of a block registration and mentoring programme entitled the “Freshman Academic Support and Tracking” (FAST) programme on the retention, exam performance and graduation of first year students from 1994 and 1995 at the University of Arkansas. The study examines whether social support has an impact on retention. The paper makes the assumption that “*social support and normative integration of freshman in the academic community is an important factor in both academic performance and retention*”. Block registration means that FAST programme students enrol in the same course and attend the same classes which allows them to interact with the same peers in the hope that they would quickly form a peer network.

The paper uses event history models to estimate the effect of the FAST programme on the withdrawal rates of the 1994-1995 cohort of students. A series of discrete-time logit models are estimated which control for fixed background variables and semester GPA. While random assignment was not possible, students who had been sampled were allowed to volunteer for the single mentor plus block registration group. This according to Mangold et al. weakened their ability to isolate the effect(s) of participation on the FAST programme as it was difficult to separate the effect of pre-existing characteristics from the impact of the programme. However they compensate for this by including a detailed analysis of the probable effects of self selection.

Overall they find that FAST participants are significantly less likely to drop out compared to their counterparts. The odds that a non-FAST student drops out are approximately 2.2 times greater than among FAST students. In addition, female and black participants are significantly less likely to dropout relative to non-participants. Females experience an additional reduction as do blacks. This is considered an important finding as the programme is of benefit to groups who normally are at a higher risk of withdrawal.

In examining graduation you find that Students who participate in FAST are more likely to graduate (.222) and are less likely to drop out(-.774) (both effects are significant). Females are more likely to graduate but more likely to drop out and blacks are less likely to graduate but more likely to persist

## **5.5 Combination of financial and other supports: exam performance and retention**

Angrist et al. (2009) examines the effect of a large randomized field experiment entitled the Student Achievement and Retention Project (STAR) at a large Canadian university in order to investigate the impact of student support and financial aid on college retention and academic achievement.

STAR is a merit based aid programme which included all first year students entering a Canadian university in 2005 with a GDP below the upper quartile. These students were then randomly assigned to one of three treatment groups or a control group. One treatment group (250 students) was offered the Student Support Programme (SSP) which offered support services, including access to mentoring by students from higher SES students, and FSG’s (facilitated study group). The SSP was motivated according

to Angrist by the view that retention is strongly influenced by a student's interaction with other people who take an interest in their welfare (Wesley R. Habely 2004) A second group (250 students) was offered the Student Fellowship Programme (SFP) which offered a cash incentive to meet a target GPA. A third treatment group was offered the SFSP which offered a combination of the SFP and SSP.

Approximately 1600 students participated in the programme. The majority of the students involved are from the local area, with a common secondary school background and well educated parents. Generally speaking there is no significantly significant difference between students in relation to age last year of high school GPA, or mother tongue.

The paper uses an '*intention to treat*' design and examines difference in outcomes for the three treatment groups compared to the control group. Several outcomes are considered - autumn and first year exam grades, first year credits, second year enrolment, and overall retention. They are examined by the different programmes and by gender. Take up rates were much higher for students who were offered the SFSP or the SFP than those students who were offered the SSP supports services alone.

The evidence suggests that the overall effects of the STAR intervention were small. Students assigned to the SFP earned autumn grades about 1.8 percentage points higher than the control group while those students who were assigned to the SFSP earn grades 2.7 percentage points higher than the control. In contrast, students offered services without fellowships did no better than those in the control group.

Although there was an initial boost to Women's fall grades in both the combined and the fellowship only treatment groups this fades after the first year for students receiving the SFP. There remains however a significant impact on GPA for women in the combined SFSP programmes after first year. He highlights that SFSP females also earned a quarter credit more than controls in the second year, so that after two years, the SFSP-control difference amounted to a little over half a credit. Angrist states that this is '*important because it shows that incentives, in combination with increased services (especially, it would seem, peer advising), changed behaviour in a manner consistent with a lasting improvement in study skills*' (Angrist; 2009)

Overall the offer of services alone (SSP) and the incentives (\$1000 cash payments) to improve the GPA targets had little effect for males, while having a positive effect for female. The use of STAR services was greater for females and for those in the SFP group. Overall the SFSP components of the STAR programme produced a greater effect than the SFP alone. This suggests that a combination of services and incentives shows more potential than either intervention alone.

## **5.6 Conclusion**

Taken as a whole the evaluations of programmes designed to provide social and academic support reviewed for this paper showed mixed results in relation to their effectiveness at influencing progression, exam performance and retention. In relation to the outreach programme EXCEL it was found that there was only a small impact on progression, and no statistical influence on individuals self esteem or cumulative GPA even with normal financial incentives attached in the form of a scholarship

provided to students. The programme did however increase students desire to attend university.

Lesik's study of a developmental mathematics programme finds it has a positive effect on retention in that 88.7% of participants survived (i.e. did not drop-out) compared to 62.7% of non-participants after the 1<sup>st</sup> year, and 81% of participant survived compared to 43.4% of non participants after the second year.

Mangold and colleague's evaluation of a social support without a financial element in the form of a block registration and mentoring programme find that the odds that a non-FAST student drops out are approximately 2.2 times greater than among FAST students. And Finally Angrist et al. (2008) find that a combination of financial and social support (services and incentives) shows more potential than either intervention alone.

## **6. Conclusion**

The question that needs to be asked is what does the term ‘access’ mean or how is it interpreted and used in relation to evaluations to higher level education. Definitions of access include: ‘*the ability, right, or permission to approach, enter, speak with, or use; admittance, the state or quality of being approachable, or a way or means of approach*’. These definitions serve to highlight what access interventions aim to do. In particular these definitions call attention to the social dimension of ‘access’ in the form of being approachable which has become a concern for universities aiming to increase their intake of students under-represented.

Access can be used as a broad umbrella term for entry to and persistence in higher level education. The term access encompasses both pre-entry support where student do ‘enter’ or ‘gain access to’ higher level education. However it is recognised that it is not enough that students enter the university but that retention or persistence is also key to a student’s access to higher level education. Entry into university is a natural boundary where access switches to retention

The question to ask following what is access is who does the accessing and why? It has long been recognised that the returns to investment in higher level is high not only for individuals but also for social groups in general, however, not all groups in society invest equally in education. Ethnic minorities and students from socio-economically disadvantaged backgrounds are often under-represented despite the known returns. This is sometimes explained away as a lack of something, for example, ‘a lack of information, or a lack of motivation or financing’. The literature tackles why these groups are under-represented by examining the precollege individual characteristics of students, the characteristics of institutions and students interactions with said institutions, while universities have developed access programmes that are designed to boost the enrolment and retention of these groups.

How access is defined affects how access is constructed. Stakeholders create and reshape the ‘access agenda of universities’ and researchers and evaluations also shape this agenda by aiming to establish what ‘access’ programmes are efficient. The key umbrella term in the area of higher education policy is ‘equity. According to Skillbeck and O’Connell 2000, terms such as ‘access’, equal opportunity’, equality of outcomes’, and ‘affirmative action’ fall under this term. However not all programmes designed to give students access to higher level education may be equitable, as can be the case with non-needs based merit scholarships. According to Finnie et al. (2008) constructing access in its broader sense i.e. not just in terms of financial barriers to higher level education, has fundamental policy implications. If differences in access among different socio-economic groups are primarily a matter of money then policy solutions would lie in the realm of financial aid.

This paper examines merit based aid and finds that according to Cornwell et al. (2006) merit based financial aid in the form of the HOPE scholarship is effective at increasing the enrolment rate at Georgian universities by 5.9% however this increase makes up only 15% of all scholarship recipients. They conclude that merit aid affects ‘where’ rather than ‘if’ a student goes to college. They also find that while merit aid can increase grades due to retention rules, it also encourages unintended behavioural

responses such as attending fewer courses, and avoiding or dropping difficult courses in order to keep the required GPA.

Needs based aid is found to be effective at increasing the probability of attending college and in staving off withdrawal. (Dynarski, 2003, Bettinger, 2004, Brock, et al. 2006). In relation to retention and exam performance Bettinger's (2004) study finds that students whose Pell grant increases are less likely to withdraw from higher level education and Brock et al. finds that the treatment group passed more courses and earned more credits. However whether or not Dynarski's (2003) and Brock's (2006) results can be generalized to the effects of aid can be questioned since the populations studied are unique; in one case a parent has passed away and in the other, all participants are lone parents.

The evaluations of programmes designed to provide social and academic support reviewed for this paper showed mixed results in relation to their effectiveness at influencing progression, exam performance and retention. The outreach programme EXCEL which combined a pre-entry outreach programme with financial aid was found to have a small impact on progression and to increase motivation to attend university, but had no statistically significant influence on individuals self esteem or cumulative GPA. Lesik finds that a developmental mathematics programme has a positive effect on retention rates showing that students who did not participate in the mathematics programme were 4.3 times more likely to drop-out over the first three years, than participants on the programme. Mangold and colleagues' evaluation of a block registration and mentoring programme that did not contain a financial element finds the programme effective at dropping withdrawal rates. Angrist et al. (2008) find that a combination of financial and social support (services and incentives) shows more potential than either financial supports or social support alone.

The aim of this paper was to explore the effectiveness of access programmes using international evidence of best practice. Overall this study concludes that interventions in the form of merit based aid, needs based aid and social supports are effective at influencing enrolment, retention and exam performance at higher level education. However merit based scholarships seem to influence where rather than if one goes to college and also has unintended negative behaviour consequences. In relation to social support where no financial support is available Mangold, (2002) finds that a block registration and mentoring programme has an impact on retention whereas Lesik (2006) finds an academic support in the form of a developmental mathematics programme effective at stalling withdrawal. However Angrist(2009) finds that a combination of financial aid plus social support seems to be more effective than either type of intervention alone.

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