An Examination of Criticisms made of Tinto's 1975 Student Integration Model of Attrition

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Abstract

Vincent Tinto's Student integration Model (SIM) (Tinto, 1975) remains the most influential model of dropout from tertiary education. This paper outlines the problems associated with student attrition and examines how the SIM models the factors that drive attrition behaviour. Three criticisms that have been made of the SIM are evaluated; 1: The SIM is not an adequate model of student attrition, 2: The SIM does not generalise beyond traditional students, 3: Academic integration is not an important predictor of student attrition. It is argued that the papers which provide evidence in support of criticisms 1 and 3 are methodologically flawed and that criticism 2 is potentially invalid as, according to Tinto (Tinto, 1982) the SIM was never meant to generalise beyond typical students. Tinto's later additions and alterations of the SIM are discussed and evaluated. The paper concludes that it is impossible to properly assess the role that the SIM can play in preventing student dropout until the model itself is satisfactorily verified.

The Problem of Student Attrition

Dropout is perhaps the greatest problem facing institutions of higher education. While attendance in primary and secondary education is compulsory, up to age sixteen, attendance in higher education is voluntary and there are a plethora of reasons why people may choose, or be forced, to withdraw. Generally speaking, enrolment in higher education continues to increase; in the United States of American enrolment in degree granting institutions increased by about 9% between 1989 and 1999 (Snyder and Hoffman, 2002). As the number of students enrolling in tertiary education increases, so does the number of students who will be affected by dropout. There is significant variance in the figures quoted for dropout from higher education, depending on both the nature of the institution(s) concerned and also with the definition of attrition or dropout used. Generally speaking, the rates of voluntary withdrawal from tertiary education are around 23% (Rovai, 2002), while the figure for attrition generally, including academic dismissal has been fairly consistent around the 50% mark for most of the last century (Leys, 1999) (Tinto, 1983) There is a significant financial cost associated with attrition: students who do not complete their studies will already have had significant amounts of money invested in their education, through both resources distributed to them and time spent teaching them. It is fairly obvious that the universities would prefer to spend this money on students who will see their degree course through to its completion There is an associated non financial cost associated with attrition: the dropout or academic failure of students can negatively affect the educational achievement and development of other students, through damaging their morale or making them question their own commitment to their course or educational institution (Tinto, 1975). Also, perhaps counter intuitively, it is rarely the least able students who dropout. Exactly the opposite, those students who dropout from higher education are often more academically able than those who stay (Tinto, 1982). That being the case, the process of attrition can result in a graduating class that is less academically able than the one that enrolled in first year. Given the costs, financial and otherwise, that are associated with attrition, it is obvious that most colleges and universities would like to better understand the forces driving it. If universities and colleges could better understand why individuals withdraw from higher education they could attempt to change their selection policies, or how they deal with their students, with a view to reducing their rates of attrition. Perhaps the most influential model of attrition from higher education was proposed by Vincent Tinto in 1975.

Vincent Tinto's Student Integration Model

Vincent Tinto's 1975 Student Integration Model (SIM) of attrition was designed to offer a longitudinal model which would explain all of the aspects and processes that influenced an individual's decision to leave college or university, and how these processes interact to ultimately produce attrition. Tinto aimed to do several things. Firstly, he aimed to differentiate between different types of leaving behaviour. This is important as there are a number of different ways in which a student may choose, or be forced to leave, college. Up until Tinto published this paper, these different learning behaviours were often grouped under the rubric of dropout. The different types of leaving behaviour that Tinto identified include academic failure, voluntary withdrawal, permanent dropout, temporary dropout and transfer.

Tinto based his model on Durkheim's theory of suicide. Durkheim's theory was based on the assertion that the likelihood that an individual will commit suicide is predicted by the level of their integration

into the fabric of society. Essentially, Durkheim argued that if an individual has an adequate social support network and sufficient moral integration, it reduces the likelihood that they will commit suicide. Tinto asserted that the act of committing suicide was essentially the wilful withdrawal of an individual from existence and was therefore analogous to dropout from higher education which was the wilful withdrawal of an individual from one aspect of society. While in Durkheim's model of suicide, the individual is committing suicide because they are insufficiently integrated into society, Tinto asserts that dropout occurs because the individual is insufficiently integrated into different aspects of college or university life. Tinto identified the two most important systems at college as academic and social and contended that dropout could occur through a lack of integration in either or both of these systems. Tinto pointed out that extreme integration in either the academic or social systems at college would be likely to cause problems in the other system. For example a student who spent the vast majority of time studying would have little time to spend in social activity and similarly if a student spent an extreme amount of time engaged in social activity, his academic performance would probably suffer. Tinto's model of attrition was not based solely on Durkheims model of suicide, as even Tinto acknowledged that this model had one great drawback; its failure to take account of individual psychological characteristics that predispose some individuals to suicide. Any model of dropout from higher education that was based solely on Durkheim's model would be subject to the same kind of shortcomings: it would fail to pay enough attention to the individual characteristics of a person that would make him more likely to dropout of higher education than their peers. Tinto understood this and his work included assessing the degree to which individual characteristics affected attrition.

The SIM Model Itself.

Tinto's SIM model had certain key features (see Appendix A). At the heart of the model is the degree to which the individual is integrated into the social and academic aspects of the university. Also of pivotal importance are both the degree to which the student is committed to their goal (i.e. degree attainment) and the extent to which he is committed to the university.

In his model, various types of individual characteristic affected the student's pre enrolment commitment to both their goal (i.e. degree attainment) and the institution they were going to attend. The characteristics that Tinto highlights as being important in influencing the individual's goal and institutional commitment are their individual attributes, precollege experiences and family background. Individual attributes covers variables such as race, sex and academic ability. Precollege experiences covers social and academic experiences like school grade point average and academic and social attainments. Family background covers factors like social status, value climates and expectational climates. Tinto asserted that there is an effect of an individual's educational expectations on their likelihood of attrition. Specifically, this is how long the student intended to attend the educational institution and the importance that the student placed upon the specific institution in which they intend to attend. There is significant variance in how committed individual students are to their specific educational institution. Some students view the college they attend as pivotal to their chances of future employment, other students may be as happy in another college as they are in the one they attend. Obviously, those students who place a great deal of importance on the college they attend are significantly more likely to persist at the college they are at, despite academic or social problems. In terms of the effect of socio economic class on institutional commitment, Tinto basically thought that individuals from higher socioeconomic class are more likely to persist at college. According to Tinto, the exact nature of the relationship is more complex than that . He asserts that while academic dismissals tend to be among those of lower social status, lower aptitude and lower levels of intellectual development than persisters, voluntary withdrawals seem to be of comparable, or higher, social class and exhibit higher levels of intellectual development than persisters. Tinto also asserts that while these individual characteristics, and the individual's social and academic integration thereafter are the most important determinants in whether or not a student persists in higher education, it is the interaction between the students' individual commitment to the goal of college completion and their commitment to the specific educational institution, that finally determines whether or not they drop out.

The students' view of their own higher education experience is obviously all important in their decision to drop out. Tinto thinks that students assess their own higher education experience in terms of a cost benefit analysis and if they feel they could get greater benefit at equal or less cost out-with the college it is likely to provoke dropout. Dropout can also be influenced by aspects of the individual's personality. Dropouts tend to be display certain personality traits; greater impulsivity, less emotional commitment to education, are unable to profit as much from past experience, more unstable, more anxious and are overly active and restless.

As previously mentioned, the sex of the student has an influence on college persistence but its influence is not entirely clear cut. Males are more likely to finish their college course, but of those females who drop out, a higher proportion of them are voluntary withdrawals. Tinto emphasises that dropout is the result of longitudinal processes of interactions between the individual and the educational institution they attend. Tinto stresses the importance of the students' view of their own academic integration and details how he thinks they assess this. According to Tinto, the student views their academic integration as being a combination of two other factors; their grade performance and their intellectual development. Again, according to Tinto, grade

performance functions as a kind of extrinsic reward while intellectual development is more of an intrinsic reward. The sex of the student also influences the importance that they place upon grade performance. Grade performance appears to be particularly important for males. Also, according to Tinto, intellectual development appears to be more important in determining persistence for females than for males. Tinto also asserts that persisters view the education process differently from non-persisters. While non-persisters view education as more of a process of vocational development, persisters see it as more to do with gaining knowledge and appreciating ideas. Tinto highlighted the importance of determining the different types of social integration and their possible consequences. He stated that social integration in college was "directly related" to persistence and while the lack of social integration would lead to attrition, it would be more likely to cause voluntary with drawl than it would dismissal. Also, Tinto indicates that while, as already indicated, very high levels of social integration may lead to deficits in academic performance, it may not lead to attrition, provided the integration has occurred with a support group who have "strong academic orientations". As well as it being important to integrate with students who are well motivated, with respect to academic work, Tinto also highlights the potential importance of social integration within the faculty itself. Social integration within the faculty itself is important as it not only increases the student's level of social integration, it also increases their level of academic integration. The student integration model also illustrates Tinto's assertion that academic and social integration, and goal and institutional commitment, are not separate and distinct, rather they have a distinct influential relationship upon each other. According to Tinto, academic integration directly influences the students goal commitment while social integration directly influences his commitment to the specific institution. Also goal and institution commitment may not both be necessary in order for someone to persist . According to Tinto, provided that a student has sufficient goal commitment, he may remain in a institution that they may have little commitment to.

While Tinto's Student Integration Model of persistence has been the dominant model of student attrition for over twenty-five years, it is far from universally accepted. There have been several criticisms made of the model.

Criticism 1: The SIM is inadequate in Modelling Student Attrition

Whilst the vast majority of studies into the SIM have been generally supportive, it has been contended that the Tinto model is globally flawed and fails to explain the majority of attrition behaviour.

For example, Vivenne Brunsden, Mark Davies, Mark Shevlin and Maeve Bracken carried out a statistical analysis on a questionnaire administered to 264 first year University students in order to assess the key features of Tinto's model (Brunsden, Davies, Shevlin and Bracken, 2000). These first year students had enrolled in one of two different courses at two different universities, one BA Computer Studies course at an English University, one BA Psychology course at a Scottish University. Brunsden et al then noted their participants enrolment status a year later, noting voluntary dropouts, involuntary dropouts and persisters. Brunsden assessed each of the participants with their own questionnaire and with proven psychometrically verified valid tests; The Eysenck Personality Inventory (EPI), Rosenberg Self-Esteem Scale (SES) and the Satisfaction with Life Scale (SWLS). The questionnaire items that Brunsden et al used to construct their own questionnaire have high face validity. Brunsden et al tested a conceptualisation of Tinto's 1975 model constructed using LISREL8 software in a way that ensured it was statistically testable.

Brunsden et al found that their conceptualism of Tinto's model did not adequately explain the data they obtained. None of the criteria for fit supported the model and the global assessment of the model proved it to be so inadequate that assessment of the individual components was impossible. Brunsden et al do however admit that there may have been serious shortcomings in their study that contributed to their results. Firstly, they did not actually assess social or academic integration, they only assessed the potential of academic and social integration. As the assessment of potential is open to subjective interpretation it is possible that the level for potential integration and the level of actual integration for any student didn't actually line up. Another conceivable weakness in this study is that it was not exactly Tinto's actual model that was assessed. In order to carry out an effective statistical test of Tinto's model they had to create their own testable conceptualisation of it. The possibility of the conceptualisation being different from the actual model in key ways means that their results are potentially invalid. Brunsden et al also criticise Tinto's model for it having its origins in Durkheim's model of suicide. Their argument is effectively that even supposing that Durkheim's original model was an accurate and effective model of suicide, there remains serious doubt over the extent to which the relationship of dropout and suicide can truly be seen as analogous. They also contend that although Tinto himself was keen to separate the different forms of attrition behaviour, that by basing his model upon one of suicide, he is effectively acknowledging that attrition is a negative process, ignoring that for many it can represent a positive experience; changing courses, having decided that one is now the preferred option, for example. Also, while Tinto acknowledged that it is the individual's own perceptions of the constructs in his model (i.e. their social and academic integration) that is important, rather than the degree to which each construct is expressed in an individual, his model entirely fails to take account of this.

Criticism 2: The SIM is only applicable to "traditional" Students

One of the most consistent criticisms made of Tinto's model is that it is applicable solely to a traditional residential type of students. Basically, it has been proposed that the Tinto model is not generalisable beyond students who are resident on, or near, campus and who enter university or college directly after leaving school. What evidence is there to support this? Alfred Rovai published a paper which discussed the extent to which Tinto's model would generalise to students engaged in distance learning programmes (Rovai, 2002). He comments that previous authors have noted that Tinto's model is of limited applicability in the study of non traditional students as it is based around the analysis of how traditional undergraduate students fit into to the institution of higher education which they attend. He points to the work of Bean and Metzner who proposed their own model of student attrition (the student attrition model or S.A.M.) and who contended that Tinto's model did not explain attrition in students who were over twenty four, did not live on campus or were not in full time education and it does not fully account for those students who do not particularly wish to become involved in the social aspects of student life and for whom the greatest concern about the university they attend is what it can offer them, academically speaking. The argument behind this way of thinking is that while most students have a fairly common form of support network; classmates, flat mates etc, that non-traditional students have a potentially very different form of support network. For example, mature students are likely to have an extensive, well established network of friends and family in place out with the university and owing to this, are less likely to need the kind of intra-university social and academic integration identified by Tinto. Similarly, those engaged in distance learning for their higher education are unlikely to show similar patterns of attrition to traditional students as they have different types and levels of social and academic integration. While these criticisms may be valid up to a point; i.e. the Tinto SIM model may not generalise beyond traditional full time undergraduate students, there is a very simple reason why this is. The Tinto model is very ambitious in its scope; one model to explain the full range of student attrition behaviour. It was fundamentally designed to describe the factors that cause students to leave higher education and is fairly successful in doing so; but, because of the ambitious nature of its design, it was almost inevitable that it would fail to address attrition behaviour of some student populations simply because their entire experience of the higher education process is different to that from traditional students. It is unlikely that any one model could account for every conceivable reason that every single departing student had for leaving higher education and one that can effectively describe the attrition behaviour of the traditional student type will still have been a remarkable success.

What evidence is there to support the assertion that the SIM does not generalise beyond traditional student types?

One study, by Torres and Solberg (2001), attempted to apply aspects of Tinto's SIM model to a sample of Latino students studying in mainstream higher education in the USA. They selected a sample of 179 students, consisting of 112 Latinas and 67 Latino males. This sample of 179 students consisted of 67 selected from a two year community college, 29 randomly selected from one four year university, 17 from another four year university and the final 66 from another two year technical college (Total N=179). The sample of 189 students responded to a demographic questionnaire along with measures of college stress, academic self efficacy, social and faculty integration, persistence intentions and stress. Amongst the results obtained it was found that social integration did not predict persistence intentions amongst Latino students. Social integration is one of the most important factors in the Tinto SIM and, as such, the implications of this result in this study need to be carefully assessed.

If we assume that the SIM model is, generally speaking, an accurate model of attrition then these results are potentially due to the nature of being an ethnic minority student. Depending on the nature of the ethnic diversity at the university, students from an ethnic minority may feel different to the other students and, as such, may not have as wide a social support network. Subjectively, you may think that this situation would predict attrition, but if the Latino student had been in a similar situation at school, then its conceivable that their level of social integration would be less important to them than to the majority of the students. This being the case, it is theoretically possible that the SIM model of attrition, or at least the social integration aspect of it is inapplicable to some students from ethnic minority groups.

Cherryll Duquette applied Tinto's SIM model to another very specific student population; disabled students at university (Duquette, 2000). Cheryl Duquette's intention was to determine whether or not Tinto's SIM could be used to assessed attrition in disabled students, with a view to increasing the proportion of disabled students persisting in higher education. In this study 36 students completed a questionnaire designed to test variables that could account for their later attrition or retention. Of these 36 students, 17 later participated in an interview. Duquette assessed her participants on three of the key variables in the SIM, the students' academic integration, their social integration and their individual characteristics. The original pool of participants that the experiment was based upon was131 English Speaking students who had registered at the centre for special services at a large university in Ontario. Of these students only 36 responded. From the 36 respondents that Duquette obtained from her survey of 131, 17 agreed to be interviewed. The audio taped interviews consisted of standardised open ended questions that were designed to primarily assess the three domains derived from Tinto's SIM model. While the use of the open ended questions may have been

conducive to deriving the most possible data from the respondents, it is also far more difficult to assess as it relies greatly on the interviewers/experimenters subjective interpretation of the respondents answer. Duquette coded the data from the transcripts of the interviews with the 17 students along with data from the 36 students who responded to the initial questionnaire. Duquette found her results were generally consistent with Tinto's SIM model. She found that academic integration and background characteristics were both important predictors of drop out behaviour, but found much less of an effect of social integration with this population.

What conclusions can be drawn from these results? While the results themselves generally support the SIM, there is obviously one exception; the social integration aspect. There are three possible explanations for this, either the SIM model is inadequate generally, it is inadequate for explaining attrition in the very specific sample of students in this experiment, or lastly the methodology of this experiment is severely flawed. One possible flaw in this study is the size of the sample used. The 36 students who responded accounts for only 27% of the original sample and this seems to indicate possible methodological shortcomings in this study. Duquette states that this number "appears to be representative of the proportion of people who make use of the services", without actually accounting for exactly, or generally, what this proportion actually is. With the proportion of respondents being this low it is possible that the sample upon which this sample is based is not representative of the disabled students at this university or of disabled students on the whole. For example, the 36 disabled students who form the initial sample are representing six different types of disability, as a result of which, some of the disabilities are represented by only a few students. While it is important that the full breadth of disability is covered in this study, having physical disability only represented by two students, hearing impairment represented by only 3 students and visual impairment represented by only four students means you are relying on these small numbers being representative of each disability Also, the sample in this study has effectively self selected as it consists of those students who replied to a questionnaire. This is potentially a problem as it indicates the sample may be unrepresentative as it may only be students with certain common characteristics who took the time to reply. It is possible that Duquette's study did produce an accurate account of attrition in disabled students. It is also possible that disabled students display attrition behaviour that is different from students in general. That lack of effect witnessed for social integration could be a function of the lesser importance placed upon social integration by disabled students within the tertiary education system, or possibly because their social support network differs in structure from that which students in general have. Duquette appears to favour this interpretation. She indicates that the disabled students in this study relied more upon family and friends outwith the university for "recreation and moral support". While it is possible that this study was representative of attrition behaviour in disabled students, the lack of scientific rigour in the way that Tinto's SIM model was applied indicates that caution should be exercised in the interpretation of the results. they do however seem to indicate that the SIM may not be applicable to disabeled students.

It appears from the results that have been discussed that there is a common theme in the application of Tinto's SIM model to non-traditional student population. It appears from the results of the Duquette (2000) and Torres (2001) experiments and from the opinions expressed in the Alfred Rovia paper (Rovai, 2002) that while the Tinto SIM model may be a reasonable model of the attrition behaviour of non-traditional students, the social integration aspect of the model made not be a significant predictor of attrition behaviour.

Is academic integration also less important for non-traditional students?

If the social integration aspect of Tinto's SIM model has been shown to have potential weaknesses in the explanation of attrition behaviour within certain student populations, what evidence is there as to the durability of the academic integration aspect? David E Towles and Jay Spencer applied Tinto's SIM model of student attrition behaviour to the student population at Liberty University School of Lifelong Learning in the USA in an attempt to develop policy to improve their rates of student retention (Towles and Spencer, 1993). The Liberty University of Lifelong Learning is a distance leaning programme that relies upon primarily video education with support from telephone, post and other technologies. As such, students enrolled in the Liberty University of Lifelong Learning can be taken as non-traditional students as defined by Alfred Rovai (2002). Towles and Spencer studied 120 students taking general education courses. This sample of 120 students was drawn from four courses, each of which contributed 15 students who had received faculty initiated contact and 15 who had not. These two groups were matched for academic performance, age etc. Towles and Spencer took the level of interaction between each student and the faculty as an indication of the level of that student's academic integration. A year later they then assessed which students had dropped out. Of the students who dropped out, only those who left for reasons other than academic dismissal were assessed. Towles and Spencer found no significant difference in the rates of dropout between those students who had experienced contact with the faculty and those students who had not. The degree of contact between the student and the faculty should represent a reasonable indication of the level of the individual's academic integration in this type of learning situation. The format of distance learning means that potentially the only one-to-one interaction that a student will have with the faculty will be through telephone. However, the definition of faculty-initiated contact is not rigorously defined in this study and there is the potential for a fairly large variety of different types of contact to be covered. The nature or content of the type of faculty-initiated contact they were assessing was not examined. If the majority of the faculty-initiated contact was primarily negative; students who have failed to

meet deadlines etc being contacted, then it is very apparent that the level of faculty-initiated contact is unlikely to predict attrition behaviour. There is the potential that, as with social integration, the aspect of academic integration in Tinto's SIM does not function as effectively with non-traditional groups. It is also possible that due to the nature of distance learning it is unique in that the academic integration aspect of the SIM model does not accurately map onto it.

Criticism 3: Academic Integration is not an important predictor of student attrition in traditional student populations.

As well as the evidence that suggests that academic integration may not be an important predictor of student attrition in non-traditional student groups, some researchers have suggested that it is invalid generally in modelling student attrition. For example, the office of Institutional Retention at Bowling Green State University produced its own analysis of student retention and attrition. They administered a questionnaire of their own construction to the 2,829 students entering first year then assessed which of these students returned for second year. This questionnaire was designed to test a number of variables drawn from the Tinto model, including. Academic Integration, Institutional Perception, Social Integration, Goal Commitment, Institutional commitment, their plans to return and whether or not they did. A path analysis was carried out on the results of the questionnaire. They found that the Tinto SIM based questionnaire explained 41% of the variance in student retention. It was found that Institutional Commitment, Grade point average and Social Integration were amongst the most important variables in the explanation of attrition. They did not however, find a significant amount of the attrition behaviour described by academic integration. Obviously, care must be taken in the interpretation of these results, this is a privately carried out study that has not been published and as such has not undergone peer review. The size of the sample used in this experiment is perhaps its only strength: it represents an 100% sample and previous researchers have contended that it is only through the use of a sample this big that Tinto's model can truly be assessed (Draper, 2002). The exact nature of some of the questionnaire items are not detailed, nor are they available in appendices of the paper. As such, it is impossible to judge just how accurate or valid their questionnaire items are, in terms of assessing attrition via a SIM-type model and this is potentially the biggest shortcoming of this study. All the data that has been obtained in this study is based upon self-report questionnaire and, as such, is open to subjective interpretation. The lack of effect from the academic integration variable could be a function of the students answering the questionnaire with a view to their self image- they don't perceive the traits that constitute academic integration as socially desirable. It could also be the case that the exact items that constitute the academic integration in this questionnaire are invalid. Academic integration, as Tinto understood it, could indeed be responsible for a great deal of attrition/retention behaviour but the items on this questionnaire are invalid and do not correctly measure this. Obviously, if caution is being exercised in the interpretation of the lack of effect seen for academic integration, caution will also be needed in giving too much importance to the significant effect observed for the other SIM based items. Due to the lack of scientific rigour demonstrated by those who carried out this study, it is possible that the effects observed due to the other variables may have been caused by the nature of the questionnaire items or how the were administered.

There have been several well controlled studies that have investigated the importance of academic integration and whose results have been consistent with its role in the SIM. Of particular note, due to the rigour with which it was constructed, was carried out by Ernest Pascarella and Patrick Terenzini in 1977. Pascarella and Terenzini tested the effect of the level of student-faculty interaction on student attrition in a traditional student population. Their experiment was designed to determine whether the amount of non-classroom interaction with academic staff that a student had was predictive of their attrition or retention. This non-classroom interaction with members of faculty staff is potentially important as it raises not only the level of that individual's academic integration but also their social integration.

Pascarella and Terenzini examined a sample of 1008 students from the incoming freshman (first year) class at Syracuse University in New York. These students were sent a detailed questionnaire. Of the 1008 questionnaires they sent out, they obtained usable answers from 766 students, all of whom had also supplied the university with completed Activity Indices AI (10) which is a measure of personality on a twelve dimension scale and all of whom had available scores on the verbal and quantitative scores from the Scholastic Aptitude Test (SAT) which give an indication of academic capability. They then tested their sample again in March the following year. Their original sample of 766 were sent further test items and they received usable responses from 536 students. Of these 536 responses, 192 had to be discounted as they had incomplete AI or SAT scores or were academic withdrawals or had left the institution before the end of the first semester. The final experimental sample was, therefore 344 students. This sample of 344 students was shown, through analysis via a Chi-squared, to be representative of the student freshman population of Syracuse University, in terms of sex and college of enrolment. The sample was assessed one more time, at the enrolment for the following academic year at which time it was determined that 55 subjects have voluntarily withdrawn. The frequency and nature of non-classroom interaction that each student had with the faculty was assessed through a series of questionnaire items administered to the students in March of their first term. Only contacts that lasted for 10-15 minutes or more were counted. Pascarella and Terenzini analysed the data obtained from their questionnaires in order to

see the effect of faculty contact on attrition behaviour, while controlling for possible effects of sex, academic aptitude and personality characteristics.

Pascarella and Terenzini found that the amount of informal contact with the faculty was found to discriminate significantly between those students who chose to leave the university and those who chose to persist. Pascarella and Terenzini's findings indicate that some students who have certain personality traits and needs are more likely to seek non-classroom contact with members of faculty staff and that as a result of this contact they are likely to attain higher levels of both social and academic integration and as a result are more likely to persist at university. The results of this experiment do however indicate that the individual student characteristics do not totally account for the difference in frequency of faculty contact for different students. This experiment is potentially important as it provides fairly compelling evidence of the usefulness of some of the most important aspects of Tinto's SIM model in predicting student attrition in a traditional student body. It is also important as it offers an interactive longitudinal examination of student attrition. Whereas most studies measure the students characteristics once, then assess dropout at a later date, Terenzini and Pascarella assessed the students at three time points which gives a better understanding of the nature of the interaction between different factors of the SIM.

How did Tinto change his SIM following the criticisms made of it?

Vincent Tinto took note of the criticisms made of his original SIM study and made alterations with a view to improving it and also answered the criticisms made of the model. In terms of the criticism that the model was only of use in describing attrition behaviour in traditional student types, Tinto had a fairly simple explanation for this. That explanation is essentially that "the model was developed to explain certain, not all, modes or facets of dropout behaviour that may occur in particular types of higher educational settings" (Tinto, 1982). Tinto had not claimed his model was generaliseable to all student types in all forms of tertiary education; the fault is not in the SIM model itself, rather it is with those researches who attempted to overextend it. He acknowledged that the SIM model "...cannot do or explain everything. One must make often difficult choices as to what is to be explained". Tinto indicated that the reason that his model was not predictive of all types of attrition behaviour was that it was not designed to, rather, it was designed to "highlight in the clearest explanatory terms specific types of relationships between individuals and institutions that may account for particular types of dropout behaviour". Tinto also later addressed the criticism that the model did not take sufficient account of the individual characteristics involved in the attrition process. Tinto himself admits that he did not focus directly on those individual characteristics but indicates that there was a reason for this, which was that he only looked at the individual characteristics in the way that they interfaced with the central aspects of his model, namely the academic and social systems of the educational institution they attended. Rather than focus on the possible effects of a myriad of individual characteristics, Tinto focussed on a few key characteristics; grade point average, family background, sex etc and then incorporated these into a model which focussed more directly on the impact of the institution itself on the attrition behaviour of its students. Tinto did concede that research had revealed several "obvious" shortcomings (Tinto, 1982). He acknowledged that his model did not take adequate notice of the role of student finance in their decision to drop out or persist. The impact of financial support, or its absence, was not examined in his original paper, nor was any attempt made to include it as a variable in his model. Intuitively it is fairly clear that there must be a significant role of finance on a student's decision to persist. It is fairly obvious that when a student is considering drop out, the potential financial impact could contribute a great deal to such a decision. Financial concerns are also important as they are one of the few characteristics that have a long-term indirect effect on the students' decision to dropout. Tinto argues that the role of finance on dropout decisions is longitudinal and indirect as financial implications may determine which university the individual chooses to attend and this may, in turn, affect their likelihood of dropping out. Once at college or university, Tinto maintains that the role of finance is not a pivotal one for the majority of students, it will be a key factor affecting the dropout behaviour of only the most economically disadvantaged students. Tinto also acknowledged that his model did not pay enough attention to the different factors which cause a student to transfer to another institution and those which cause them to withdraw from all forms of tertiary education. Tinto was keen to distinguish between the different types of leaving behaviour in his original 1975 paper, but did so without adequately incorporating, or indeed distinguishing between, different types of leaving behaviour with regard to his own model. The factors which drive someone to remove themselves entirely from all types of higher education are likely to be very different from those factors which drive someone to transfer from one educational institution to another. In his 1982 paper Tinto tentatively indicated methods through which transfer between institutions could be modelled, namely through analogy with models of individual migration and the interplay of "pull" and "push" factors (Tinto, 1982) He also conceded that his original model did not pay enough attention to the different educational experiences which occur due to differences in sex, race and social status. He indicates that possible race, age and gender differences present in attrition behaviour mean that its probable that because of methodological reasons, separate models will need to be created for each important potential student sub group. He indicates that, while it is tempting to try and include race and sex as variables in regression analyses of attrition data, that this is fundamentally inadequate as to do so would be to fail to capture the full extent of the breadth of both quantitative and qualitative differences

that need to be considered.

Perhaps the key aim of any model of dropout is that, in the long run, it could result in the elimination of, or at least significant reduction in, dropout. If a model that asserts to accurately portray attrition cannot play a role in actually reducing it, it calls into question the purpose of its existance. The fundamental implicit purpose of all research into student attrition is its reduction. It is therefore very significant that Tinto questioned whether or not it is possible to ever make a significant reduction in the global, or even national, rates of student attrition. Tinto's own opinion was that there was no way to significantly alter student rates of attrition without "some massive changes in both the structure and functioning of higher education in the United States" (Tinto, 1982). Tinto also points to evidence from history: that despite changes in composition of the student body, changes in administration and changes in society as a whole, that rates of attrition have barely changed in over a century (Tinto, 9182). According to Tinto, such data suggests that "we should be much more conservative in our projections regarding our ability to significantly reduce dropout in higher education at a national level" and "...we need ask not whether we should eliminate dropout (since this is not possible)" (Tinto, 1982). It appears that Tinto is basically admitting that it is effectively impossible for education theory to significantly affect the rates of student attrition. This being the case, is there any worthwhile application of attrition theory and Tinto's SIM model?

Subjectively, it would appear not, but Tinto does not concur. It is his thought that, although there is little chance of reducing attrition rates globally, there is the possibility that attrition rates may be reduced in certain subgroups of the population. This is a fairly admirable sentiment but the logical consequence of increased retention amongst some sub groups of the population, while attrition rates generally remained constant, is that dropout would increase in other groups. In practice, increasing the support or resources given to some students would either mean the institution would need to increase spending generally or reduce the support or resources given to other students. Spending more on sub groups of the population would almost invariably mean denying it to other groups. Lessons learnt from affirmative action in employment in the U.S. indicate that not only is this kind of practice impractical, it is very possibly discriminatory too. Altering selection methods in order to select students that Tinto's SIM shows are least likely to dropout is one possibility. Such a practice, however, would inevitably be prejudicial as colleges and universities would need to start selecting upon the basis of race, age and sex rather than academic aptitude. Although Tinto concedes that it is unlikely that national rates of attrition will be affected by education policy, he does however suggest that institutions could implement several changes in order to minimise their rates of attrition. Specifically, it is important for universities and colleges to increase the amount of non-classroom contact between the faculty and the students. Tinto feels that such contact directly affects the likelihood that a person will persist in higher education and as such, such contact should be regular and structured. Tinto also points to one possible indirect way to reduce attrition and that is for universities and colleges to advertise the social and academic aspects of their institutions more realistically. By doing so, Tinto asserts that it would reduce the number of students entering an institution with an unrealistic image of what it will be like. This should in turn minimise attrition, as there would be fewer students dropping out or transferring from institutions that they had found to have less social activity or less academic opportunity than they were led to believe.

Tinto's SIM model: Its Revised Form

In light of the questions asked as to the usefulness of research into attrition, where does the SIM model currently stand? Tinto still stands by the core elements of his model, and essentially still stands by how they relate to each other, but has updated it to take account for factors which he now acknowledges as important (see Appendix B) (Tinto, 1997). Tinto has switched the focus of his research to highlight the importance of the classroom in the education and attrition process. He states that it is from the classrooms, and the interaction that occurs with the faculty therein, that the processes of academic and social integration emerge. This is because the classroom is the common factor in any students educational experience. Tinto asserts that it is therefore primarily through the classroom that the rates of attrition can be reduced. He asserts that his previous model went wrong in its modelling of the relationships between learning, persistence, involvement and quality of effort. He now asserts that there is a dynamic interplay between these variables, the exact nature of which is not entirely clear. He also asserts that his previous model was inadequate in that it dealt with social and academic integration as entirely separate and discrete. He has since modified his conceptualisation of these factors and now claims that the two factors are really part of one larger process and as such are indivisible and cannot be considered individually. Tinto now maintains that it is more valid to consider academic integration as being nested within the broader sphere of social integration. Whereas his previous SIM had the concepts of social and academic integration happening at the same time, he now considers that the two are of importance at different points through a student's academic development. Fundamentally, social integration is in the ascendance initially and for the first year or so, when it is important for students to develop social relationships to act as a support network. If the student does not feel that he is sufficiently integrated in the first year it is likely that they will dropout. However, if the student does not feel they are sufficiently socially integrated towards the end of their degree course, it is unlikely they will drop out, as by this stage they will be more committed to the completion of their course. In the last year of a degree, academic integration appears to be

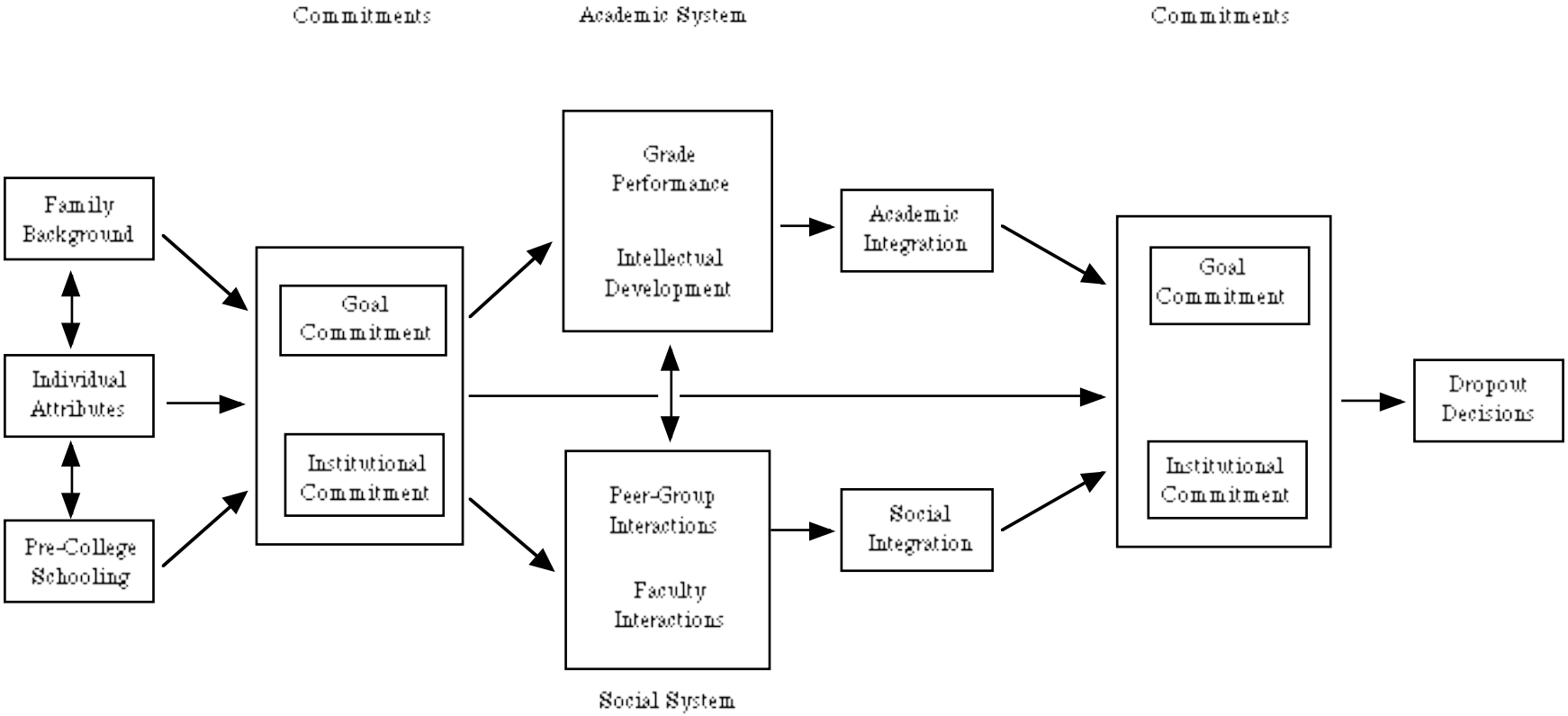
more important for the majority of students than social integration.

As compelling as this addition to SIM theory sounds, is it likely to improve the theory, and upon what is it based? Tinto's changes to his SIM are based upon his study of the educational experience of students enrolling in Coordinated Studies Programs at Seattle Central Community College (Tinto,1997). The Coordinated Studies Program (CSP) is based upon SIM theory. According to Tinto, it gives students the chance to "share the curriculum and learn together". Students engaged in a CSP enrol in several courses tied together with a common theme. All the tutors are presented at every class and the students are required to participate in coordinated learning projects. This type of education is meant to foster strong links between the students and between the students and their faculty. What evidence is there that this type of educational experience is in any way superior to the norm? Tinto found that students on the CSPs had greater perceived developmental gains than their peers on non CSP courses. He also found that students on the CSPs reported greater involvement in a range of academic and social activities. Perhaps most importantly, those students on the CSPs were significantly more likely to return for subsequent terms (83.8% vs 80.9% for Spring Term and 66.7% vs 52.0 for the end of the following Autumn Term). Tinto asserts that the CSP is so successful as it does more than just help students form friendships. He asserts that it helps to bridge the divide between the social and academic aspects of university life. While often first year students have difficulty in effectively combining the social and academic facets of university, those students who were on CSPs had less difficulty as their social and academic lives had been drawn together. Tinto feels that by putting students in an environment where they are learning in collaborative groups helps students to develop a support network of their peers, which, in turn helps them to get further integrated into the social aspect of university while also helping them to get integrated to the academic life at the university. Tinto also felt that the common curriculum helped to bring the students and the faculty together which, in turn, enriched the student's learning process. He also stressed how important it was that the students were actively involved in their own learning, and asserted that if they were, they would find learning less problematic and would be more likely to persist. He did express caution in the interpretation of the relationship between learning and persistence. While the amount of learning a student does may increase his chances of persistence, it is not a simple direct relationship. As he indicated in his 1975 paper, excessive learning may lead to a failure to integrate socially, which could lead to drop out.

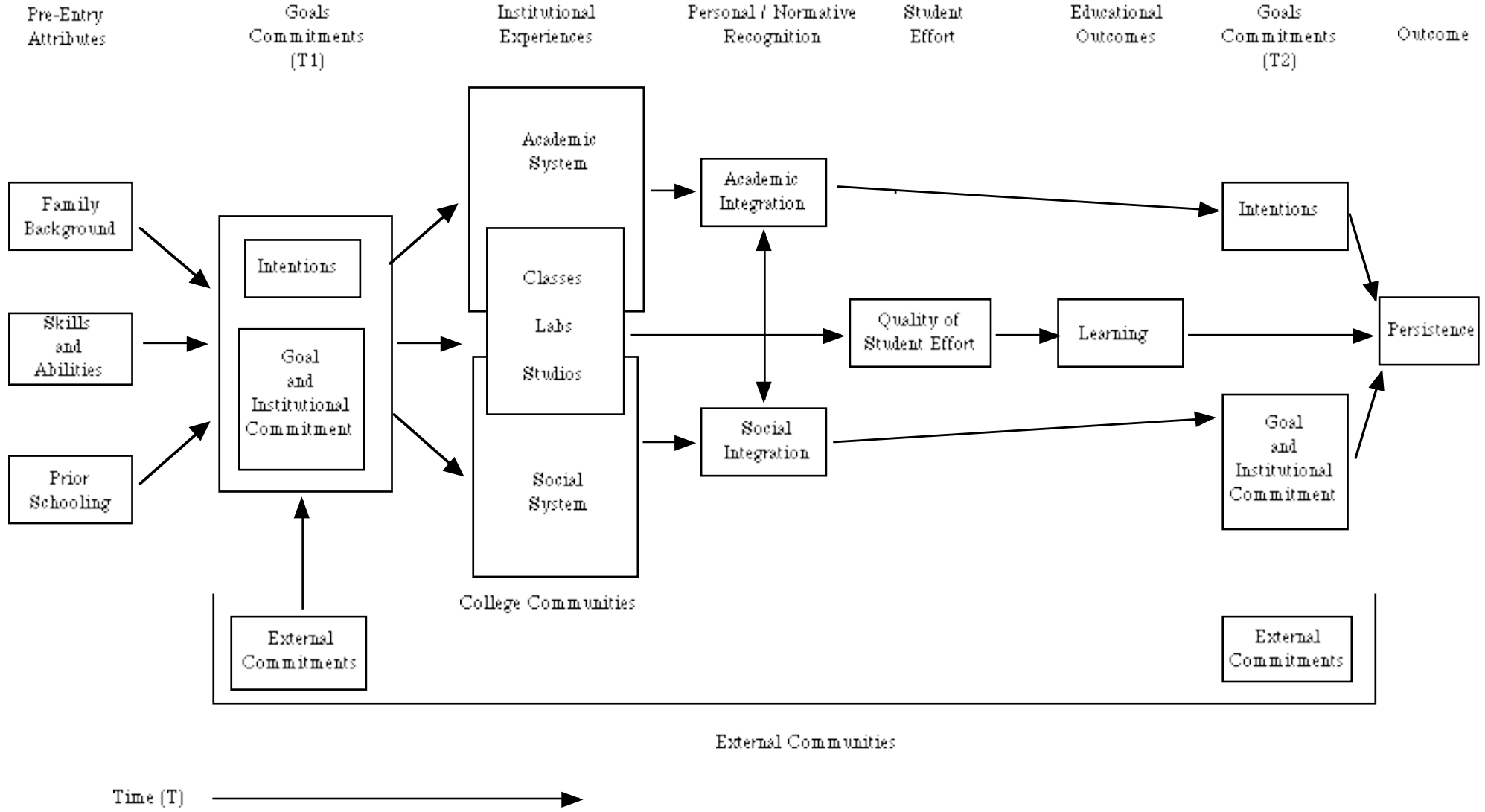
Discussion and Conclusion

While the sentiment behind Vincent Tinto's work into student attrition is doubtlessly admirable, the practical benefits of it are less impressive. There is an abundance of studies that are partially or entirely supportive of Tinto's SIM model (Duquette, 2000) (Pascarella and Terenzini, 1975) (Torres and Solberg ,2001) etc. Despite this, there is very little evidence that suggests that the SIM can be of any practical use in the reduction in attrition rates. Some of Tinto's most recent work (Tinto, 1997) indicates that there may be some pragmatic benefit of the SIM. His work on Coordinated Studies Programmes at Seattle Central Community College show that retention rates could be improved by as much as 14.7%. While these results are encouraging for proponents of Tinto's theory they need to be placed in context. Firstly these results were obtained in a one-off study in one institution, and as such the methods may not produce results that are as encouraging if applied in another setting. Also, even assuming the results are valid, they may not prompt other institutions to use CSPs. The changes made at Seattle Central Community College may have been successful, but it is unlikely than many institutions, especially those offering four year degree courses would be able to implement such a shared curriculum. Even those institutions that felt they could implement a CSP, would need to consider the implications of such a change and whether or not they could justify such a change when supported by so little evidence.

Tinto's modified SIM model needs to be adequately tested. A study needs to be carried out that uses an entire academic year as a sample. That sample would need to be assessed pre-enrolment for its composition, both in terms of surface variables like age, sex and race, and in terms of deeper factors, like academic proficiency, intelligence, personality and commitment to the institution and course. Intelligence and personality would need to be assessed through statistically validated methods, rather than questionnaire items of the experimenters construction. The sample would need to be repeatedly assessed for course and institutional commitment, along with academic integration and social integration throughout the year, in order to see if these factors interacted and developed in the way predicted by Tinto. The sample would need to be assessed through the course of their degree. Those students who left would need to be tested to glean information about why they were leaving and if they intended to attend another institution. All the data would need to be fully statistically analysed, with separate analyses carried out for any potentially important subgroups. This may sound complicated, and admittedly it is, almost to the point of being unworkable, but this represents perhaps the only method of properly assessing the modified SIM. Perhaps the greatest flaw of the original SIM was that it was never properly statistically verified. If the modified SIM and Tinto's attrition theory in general are never properly assessed, it will never be possible to conclusively say what effect they may have in the future in the reduction of dropout.



Appendix A: Tinto's original SIM (adapted from Tinto, 1975)



Appendix B: Tinto's revised model of student attrition (adapted from Tinto, 1997)

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