

An exploration of learner progress and drop-out in Korea National Open University

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This study examines which factors make a difference in distance learners' achievements and also their continuous enrolment status over one year in Korea National Open University. A path analysis revealed that while learners' job load had no directly significant effect on grade-point average (GPA), it had a significant indirect effect on GPA via the study time variable. In addition to study time, social integration and extra face-to-face activities were found to be significant variables acting on their GPA. In predicting subsequent enrolment, face-to-face activities were the most influential up to a year later. The results of this study challenges the prevalent view that GPA has something to do with drop-out, suggesting that learner progress toward achievement and drop-out may be understood better when viewed separately, especially in the case of long-term distance learning.

Introduction

Learner progress and drop-out have been of major interest in research in distance education (Garrison 1987), and the research centres around the following question: In a given distance education setting, what makes some learners fail to complete their studies while others are successful? Traditionally, research that focusses on this question has been regarded as a 'drop-out study'. At the same time, such research has been tacitly assumed to answer the question of learning achievement, that is, learner progress. Kember (1989, p. 209) made this explicit, saying that learner progress and drop-out can be viewed as two sides of the same research question. The results of our study, which used a longitudinal approach, suggest that Kember's assumption may be incorrect because it is derived from the limitations of his research design which heavily relies on cross-sectional data.

With cross-sectional data, researchers develop a path model describing which factors influence achievement, course completion or withdrawal, and the relationship among factors. Kember et al. (1991) set a path of success or failure according to the degree of the learners' involvement in both social and academic integration. Billings (1987, p. 748) found that

'attitudinal/outcome variables and the intent and lesson submission variables' were significant in explaining distance learners' completion of a course. While their contributions help our understanding of drop-out phenomena occurring within a one-term course, there remains a problem for educators, administrators, and researchers wanting to know what happens to distance learners who are in the middle of several years of such courses. Under such conditions, a longitudinal research method is called for exploring longer-term distance learning projects. Tinto (1975, p.120) suggests that looking at 'the longitudinal progress of drop-out as reflected in longitudinal follow-up data rather than cross sectional data' is crucial in the study of drop-out.

One of the contexts in which distance learners study a series of courses as compared with a single course of study is the open university, various forms of which can be found throughout the world (Brown and Brown 1994). Open universities provide instructions mainly through pre-packaged materials, so learners have relatively fewer opportunities to interact with instructors and peer learners than those who are in other modes of delivery in distance education, such as video, audio, or computer conferencing. Perhaps it is this situation of learners undergoing long-term distance learning without regular attendance, that explains why most research studies on drop-out in distance education have come from the open universities. Notable studies include those from the Athabasca University in Canada and the Dutch Open University (Powell 1991); the British Open University (Kennedy & Powell 1976); and the German Fernuniversität (Peters 1992). Little attention, however, has been given to the research conducted at Korea National Open University (KNOU). Based on longitudinal survey data collected within a one-year term in both 1995 and 1996, our study examines factors affecting distance learners' achievement and drop-out in KNOU, assuming that the two are separate questions.

Research design

Context:

Korea National Open University (KNOU) is a single-mode distance education institution serving higher education since its foundation in 1972. As of 1996, the enrolment reached 215,788 with 655 faculty and staff (KNOU Brochure 1997). Correspondence is the backbone of the instructional delivery systems of KNOU, with pre-packaged materials that include textbooks, audio and video tapes, a study guide etcetera. This delivery system, which requires no regular attendance at the university, makes self-pacing very important but at the same time difficult to maintain on the part of learners, because it takes years of time to complete

their degree programs. The situation has remained the same, even though various communications technologies are currently incorporated in order to facilitate more interactive teaching and learning in KNOU (KNOU brochure, 1997).

Research questions

In order to explore learner progress and the problem of drop-out in KNOU, we raised the following questions:

- What factors are influential on learner achievement at KNOU, and how can the relationship among variables be delineated?
- What is a significant element affecting KNOU learners' subsequent enrolment or non-enrolment?

While the first question deals with learning achievement process (a generic concern of any educational program or institution), the second question is critical to single-mode institutions which provide a large student body with only distance education (Bajtelmit 1991).

Data and sampling

The set of data used for this study was collected through stratified sampling in order to make the sample representative of the whole student body of KNOU (Choi, et al. 1996). Of the 196,175 enrolments of the Spring semester in 1995, 5% were randomly selected, amounting to 9,809 learners. Through three separate mailing surveys with soliciting letters at the second and third mailing, dated from early September to mid November in 1995, 4,668 learners responded (response rate of 47.6%). Because the second question of this study examines which factors can predict whether or not students would enrol in a forthcoming semester, the focus of this study included 1,994 learners who also participated in the follow-up survey conducted one year later in 1996. Therefore, the mail response rate of the data analysed in this study amounts to 19.94%.

Demographic information

The characteristics of the sample used in this study are as follows: 59.1% females and 40.9% males; 51.4% married and 48.6% unmarried; 82.2% having a full-time job and 17.8% a part-time job; aged from 18 to 59 years, with an average age of 31, distributed across the 16 academic departments at KNOU.

Variables

The variables selected for this study are job load, social integration, willingness, the amount of study time, planned learning, and face-to-face supplemental activities. Having scrutinised the approaches or

methodologies concerning drop-out issues in distance education, the researchers adopted the Garrison (1987, p.95) recommendation to start from the 'appreciation of the unique and critical aspect of distance education' rather than from demographic and descriptive surveys which have been prevalent in most of the studies. Taking his recommendation into account, we identified three background or exogenous variables, i.e. job load, social integration, and willingness. In determining the endogenous variables – study time, planned learning, and face-to-face activities – we drew upon the literature regarding learner characteristics in the open universities context (Peters 1992; Heinze 1983) and previous studies on student progress (Kember et al. 1992; Billings 1987; Sweet 1986).

We selected items measuring the variables in the existing survey questionnaire developed by a research team at the Student Guidance Center, Korea National Open University. Out of 48 questions, each having its own sub-items in the questionnaire, we selected 20 items for this study, in addition to the demographic questions. The meaning of the variables and the number of items used to construct each variable are discussed below. The list of items and measurement of scale are provided in the Appendix to this paper.

Exogenous variables

- Job load (2 items): To what extent do learners feel job load from their workplace?
- Social Integration (4 items): To what extent are learners encouraged by the people around them to study in and to feel part of KNOU?
- Willingness (2 items): To what extent are learners willing to complete their studies?

Endogenous variables

- Study time (3 items): An amount of and a pattern of managing study time learners spent the last semester.
- Planned learning (3 items): to what extent do learners systematically organise their learning project?
- Face-to-face activities (3 items): To what extent do learners participate in face-to-face supplementary lectures and to what extent do learners need residential schools?

Outcome variables

- GPA: Student's Grade Point Average up to the point of the survey.
- Status of enrolment in the spring of 1996.
- Status of enrolment in the fall of 1996.

TABLE 1
Descriptive Statistics of the Variables

	N	Minimum	Maximum	Mean	S.D.
Job load	1623	2.0	7.0	4.92	1.07
Social integration	1621	4.0	10.0	8.06	1.26
Willingness	1981	2.0	4.0	3.26	.48
Study time	1927	3.0	15.0	8.49	2.48
Planned learning	1980	3.0	6.0	3.65	.89
Face-to-face	1858	3.0	10.0	6.00	1.62
GPA	1987	.0	3.09	1.82	.61

Table 1 shows descriptive statistics of variables used for exploring the process of KNOU learners' achievement and subsequent semester enrolment status. Since the scales of measurement are inconsistent across variables, the minimum and maximum values in the table imply a possible range in which a respondent's score is located, and the higher the score, the greater the meaning of each variable. The correlation values between the variables used in this study are presented in Table 2. Although the overall magnitude of the correlation is not high, most of the intercorrelations are found to be statistically significant.

TABLE 2
Intercorrelations of the variables

	1	2	3	4	5	6	7
Job Load	1.00						
Social integration	-.12**	1.00					
Willingness	-.08**	.15**	1.00				
Study time	-.14**	.16**	.10**	1.00			
Planned learning	-.01**	.16**	.09**	.53**	1.00**		
Face-to-face	-.08**	.18**	.17**	.10**	.06*	1.00	
GPA	-.10**	.13**	.01	.33**	.21**	.12**	1.00

*: $p < .05$, **: $p < .01$

Data analysis and findings

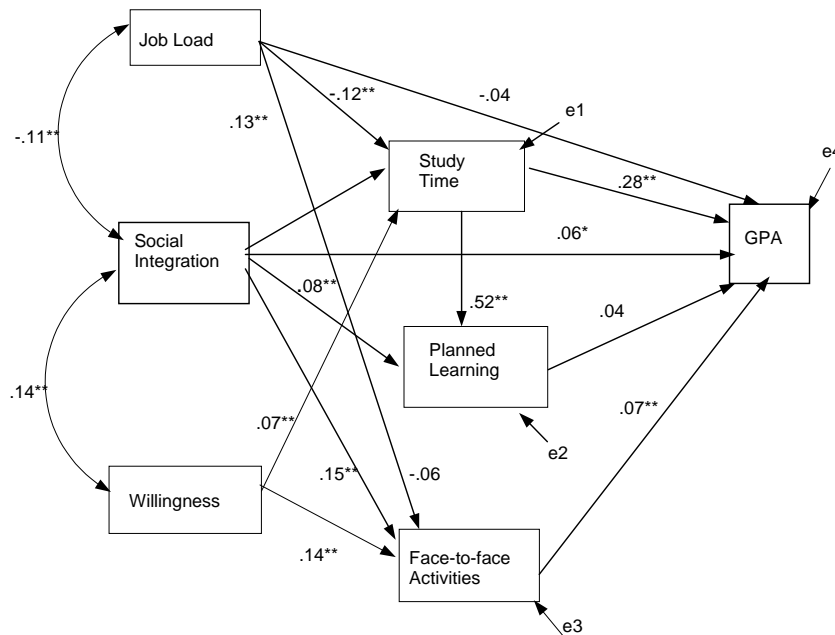
Path analysis

A path analysis allows researchers to test how well their hypothetically constructed model fits into the empirical data (Klem 1997). In our path model as shown in Figure 1, it is assumed that the dependent variable, i.e., learner achievement (GPA), is explained by the three variables associated with learning processes, i.e., study time, planned learning, and face-to-face activities. Also, learner achievement is assumed to be influenced by three background variables, i.e., job load, social integration, and willingness, with indirect effect of the endogenous variables. A statistical package AMOS 3.6 (Arbuckle 1997) was employed for testing the goodness of the model. Since there seems to be no consensus in using specific indices for evaluating overall goodness of fit for a path model, the following were chosen for this study based upon the researchers' previous experiences: (1) χ^2 likelihood ratio statistic, (2) Bentler's (1990) normed comparative fit index (CFI), (3) Tucker-Lewis's (1973) non-normed index (TLI), and (4) Root Mean Square Error of Approximation (RMSEA; Steiger 1990).

CFI and TLI values of greater than 0.90 and an RMSEA value of less than 0.08 determined acceptable fit of the current path model. The results of the path analysis showed that the hypothetical model fit fairly well with the empirical data (CFI=0.98, TLI=0.95, RMSEA=0.043), even though the χ^2 goodness-fit-test was statistically significant, which means a lack of fit for the model. The Squared Multiple Correlation (SMC) for the achievement variable was 0.118, meaning six variables used in the model altogether account for 11.8% of the variance of GPA. This is slightly higher than that of Kember's model in which the coefficient of determination for the GPA was reported as 0.10 (Kember 1991, p. 11).

Overall, the magnitude of the coefficient among variables turned out to be small, although most of the arrows, indicating the direction of the influence between variables, were supported at the 0.05 level of statistical significance as shown in Figure 1. In understanding the statistical significance shown in the path model, it is necessary to pay attention to the cautions and grounds of the method of path analysis from Pedhazur's (1997, p.769) assertion that 'path analysis is intended not to discover causes but to shed light on the tenability of the causal models a researcher formulates based on knowledge and theoretical considerations'. In other words, our model should not be counted as the best way of explaining KNOU learners' progress, but it may be a plausible way of explaining the phenomena under study with the support of statistical testing which is assisted by sufficiently large sample size.

FIGURE 1
A path model of learner progress at KNOU



* $p < .05$, ** $p < .01$, $e1 - e4$: residuals

Logistic Regression Analysis

As the dependent variable is dichotomous, that is, enrolment or non-enrolment, and multiple independent variables are under scrutiny, the logistic regression was employed as a statistics technique for the second question (Wright 1997). The Statistical Package for Social Science (SPSS) 7.5 software was used for this part of data analysis. In predicting the enrolment status of those who participated in the survey for the Spring of 1996, right after the semester survey had been done, of the seven variables (including GPA) in the path model, face-to-face activities ($B=.1989$, $S.E.=.0521$, $Wald=14.5754$, $df=1$, $sig.=.0001$, $R=.1030$) and social integration ($B=-.1425$, $S.E.=.0652$, $Wald=4.7764$, $df=1$, $sig.=.0289$, $R=-.0484$) variables were significant. When predicting enrolment or non-enrolment occurring one year later, only the face-to-face variable ($B=.1350$, $S.E.=.0475$, $Wald=8.0720$, $df=1$, $sig.=.0045$, $R=.0695$) survived at the p value of $.05$.

Discussion

It is not surprising to find that the amount of study time learners spent was the most influential factor among the three variables of study time, social integration, and face-to-face activities, which turned out to have significant effects directly on GPA. In spite of the criticism about only using grades as a measure of learning achievement (Hackman & Walker 1990, p. 197), we chose it because there seemed to be no alternative variables to represent the learners' achievement within the existing data. While Heinze (1983) reports both 'study plus work' and 'study plus family plus work' as the main problems for adult distance learners, our research reveals that the degree of job load self-reported by respondents does not directly affect GPA, but does so indirectly through the study time variable. This result seems to imply that adult distance learners in Korea with a similar demand from their workplace could end up with different grades, according to their time management skills or an environment allowing learners to plan their own study time.

In predicting the subsequent term enrolment, the face-to-face variable is the only significant one in both the Spring of 1996, and Fall of 1996. It is interesting to note that the GPA did not show statistical significance in predicting learners' persistence, unlike the profound influence proved in a cross-sectional data analysis, for example, Kember et al.'s work (1991). Since KNOU has a policy which does not regard learners as drop-out until they fail to register after three consecutive terms of non-enrolment (Kim et al. 1994), the 281 learners who were counted as non-enrolment in the Spring of 1996, as well as 321 students in the Fall of 1996, cannot be labelled as drop-outs. However, a moderately high correlation between the two enrolment variables (0.5182, $p < .001$) makes us surmise that it would be increasingly difficult for them to return to KNOU as time passed, therefore becoming a real drop-out.

Discovering the contribution that face-to-face activities have in sustaining learners in KNOU seems to be the biggest harvest of this research, but the interpretation of its meaning poses quite a challenge. Since this variable is a composite score of items asking about the need for a residential school, joining a study group, and the extent of participation in a face-to-face lecture session, it would be appropriate to take all three components into account. Whether or not it is valid or necessary to require residential sessions for distance learners has been a debated issue in distance education (Morgan & Thorpe 1993). On the one hand, a residential school is claimed to enrich distance learners' experiences by providing a variety of academic and social activities otherwise unavailable to them. On the other hand, a residential school inevitably entails the problems of access for those learners who cannot afford the time and cost to attend (Kember and

Dekkers 1987; Siaciwena 1990). The effect of joining a study group, which is voluntarily initiated as a self-help by distance learners, is also inconclusive in terms of its function (Choi et al. 1996). Choi and her associates contend that there is no significant difference in terms of grade achievement between students who join a study group and those who do not. This counters the result of former research studies on the same topic, concluding that 'getting together' as a group seems to exert a psychological and/or socialising function, e.g., encouraging each other and sharing concerns. The effect of socialising among peer learners appears to have some link with persistence. It is supported by a group comparison that those who participated in a study group showed a higher completion rate for courses over the group who did not join it (Choi et al. 1996, p. 81).

With the information from this study, it is difficult to discern the significance of face-to-face activities. Does it mean that learners in open university contexts need to contact tutors and peer learners face-to-face? Does it mean that distance education institutions are not responding well enough to satisfy the learners' needs for interaction through communication media (Moore 1989), thus forcing distance learners to stick with or to depend on the face-to-face mode of extra activities?

The effect of social integration on learners' status of enrolment in the following semester was statistically significant, but attention needs to be paid to the interpretation of its meaning due to its negative direction (standardised beta of -0.1425). Tinto (1975, p.107) adopted the construct of social integration originating from Durkheim's theory of suicide, in explaining drop-out phenomena in higher education. He conceptualised social integration as 'notions of both levels of integration and of degrees of congruency between the individual and his social environment' and illustrates the example as occurring 'primarily through informal peer group associations, semi-formal extracurricular activities, and interaction with faculty and administrative personnel within the college'. In the process of adopting the construct of social integration into the research on drop-out in distance education, Kember (1991, p.13) operationalises it as two factors: 'emotional encouragement and external attribution' caused by 'the work, family, and social lives of the students'. This resulted in switching the locus from social relationship among those involved in academic settings, to social relationship among those who are outside of education institutions. The path of social integration, however, ended up with no significant influence on students' GPA or the drop-out ratio in empirical verifications followed by a replication study (Kember et al. 1991; Kember et al. 1994).

In this study, we used the items measuring the degree of social integration in Kember et al.'s terms and found a negative direction in predicting subsequent enrolment. How is it possible for learners who received more

support from colleagues, employers, and families to turn out to be less likely to continue their distance learning than are those with less support? One possible interpretation may be that distance learners, at least in the context of KNOU, need understanding or assistance from those around them, recognising that they carry a burden to satisfy the expectation of those significant others by completing their studies. Herrmann's (1988, p. 12) appropriation of the concept of 'side bet' might be useful to understand this phenomenon; that is, even though study persistence is not necessarily related to others' interests, 'it will be lost if the commitment is not maintained and finally fulfilled,' affecting others after all. Hence, distance learners who receive more support from those around them tend to avoid enrolling the subsequent semester largely due to a lack of confidence to complete their studies, coupled with the felt pressure coming from the expectations of others. Once learners are enrolled in a course, however, the positive correlation between social integration and GPA supports the argument that they are more likely to achieve more than others who are less socially integrated.

In summary, this study suggests a view that the influence of distance learners' social integration with people outside the education institution have dual effects in explaining academic achievement and drop-out. Another possibility in explaining the result of negative influence of social integration would be to regard it as trivial due to measurement errors that could not be controlled in the research. However, the concept and meaning of social integration for distance learners should be further investigated in subsequent research.

Limitations

This study has limitations inherent in using the existing data, called the second analysis. Both the restricted numbers of items used in this study and different scales of measurement seem to have resulted in low reliability. This low reliability, in turn, may have contributed to the low path coefficients, which are calculated based on the intercorrelations among variables. Therefore, although we can develop a path model which reasonably fits into the real data, and as Wright (1997) notes, 'fit has nothing to do with the magnitude of coefficients,' further research (ensuring reliability of each variable) is called for to discern and compare the magnitude of the variables' relationships more rigorously.

Conclusion

In explaining the process of KNOU learners' achievement, a path model having two sets of causal links was developed. Learner achievement was

set as dependent on three mediating variables such as study time, planned learning, and face-to-face activities, which were assumed to be related with three starting variables – job load, social integration, and willingness. Among the six variables developed in the path model, study time was the most influential in explaining learning achievement measured by GPA. In predicting subsequent enrolment, both face-to-face activities and social integration variables were found to be significant. Moreover, it was the face-to-face variable that had a longer lasting effect on distance learners' enrolment and non-enrolment up to a year later after the first survey had been done.

The results of this study support the argument that for a high completion rate and a better learning outcome, distance learners need to exert a proper amount of independence while being involved in interaction activities as well (O'Reilly 1991; Paul 1990). If independent learners are defined as those who effectively direct their learning at their own pace while benefiting from the independence of time and space (Moore 1986), it is vital that distance education institutions devise strategies to help them become independent. In doing so, our study suggests that time management is one of the most important strategies distance learners need to master. Furthermore, this study calls for researchers interested in interaction issues to be sensitive to the counterparts of the interaction, namely, people within or outside of the distance education institution. To learners in Korea National Open University, interaction with people within the university such as faculty, tutors, and peer-learners was significant in enhancing both their academic achievement and subsequent enrolment. But the strong social integration with people outside the institution such as family, friends, and employers, exerted a negative influence on their continuing studies.

In terms of research method, the analysis of longitudinal data challenges the prevalent view of the relation between learner progress and drop-out research in distance education, suggesting that these two inquiries may be understood better when they are viewed separately, especially in the case of long-term distance learning. Our findings (indicating that not all variables significant in explaining learners' progress toward a course achievement necessarily contribute to the prediction of drop-out) support this assertion. Our study, however, could not explain why the social integration variable has contradictory consequences, and the path model we developed needs to be verified through replication studies. Therefore, we expect researchers in distance education will broaden and refresh their perspectives when they pursue these important issues of learner progress and drop-out.

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Appendix: Items selected for the study**Exogenous Variables**

- Job load: to what extent do learners feel job load at workplace.
 1. 1. How much of a workload do you have in your current job?
 - 2*. Because of a demanding job, I cannot afford needed time for study.
- Social Integration: to what extent are learners encouraged by people around them for their studies and feel them belonging to KNOU.
 - 1#. How many of your colleagues and/or employers in your workplace are aware that you are taking courses at KNOU?
 - 2*. People around me encourage me a lot to continue my studies.
 - 3*. I encourage fellow learners when they are in trouble.
 - 4*. I hardly feel that I belong to KNOU as a student.
- Willingness: to what extent are learners willing to complete their studies.
 - 1*. I would be willing to change my job if it would bother me in doing my studies.
 - 2*. No matter how hard it is, I will try to complete my studies.

Endogenous Variables

- Study time: a pattern of managing and amount of study time learners spent last semester.
 1. What kind of study pattern did you use in terms of time management last semester?
 2. How much time did you spend for study per week last semester?
 3. During the period of mid-term and final exams, how much time did you spend studying per day?
- Planned learning: to what extent do learners systematically organise their learning project.
 - 1*. I try to keep a regular schedule for my studies.
 - 2*. When I watch and listen to the broadcasting lecture through T.V and/or radio, I reserve extra time before or after that in order to review the content.

- 3*. I tend to study with a well planned weekly, monthly and/or the whole semester-based schedule.
- Face-to-face activities: to what extent had learners participated in face-to-face supplementary lectures offered, and to what extent do they need a residential school.
- 1#. What do you think about the length of the current required residence class?
- 2*. Did you join the study group for the last semester?
- 3#. How many times did you take part in lecture sessions offered by the Student Association?

Outcome variables

- GPA: Student's total GPA up to the point of the survey
- Status of enrolment in spring of 1996
- Status of enrolment in fall of 1996

(* items were measured using a scale of yes or no, # items using four point of Likert type scale, and the remaining is five point of Likert type scale)