DOCUMENT RESUME

ED 154 115 CE 014 846

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TITLE Correspondence Studies. Recruitment, Achievement and Discontinuation. (Condensed and Abridged.)
INSTITUTION NKI-Skolen Undervisningssentrum, Oslo (Norway).
PUB DATE 72
NOTE 51p.; Some figures and tables may not reproduce well due to small print

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS *Academic Achievement; *Correspondence Study; Dropout Characteristics; *Dropout Problems; Dropout Rate; Educational Problems; Enrollment Influences; Foreign Countries; Geographic Distribution; Home Study; *Persistence; *Predictor Variables; School Demography; School Registration; School Statistics; Student Characteristics; *Student Recruitment
IDENTIFIERS Norway (Oslo)

ABSTRACT

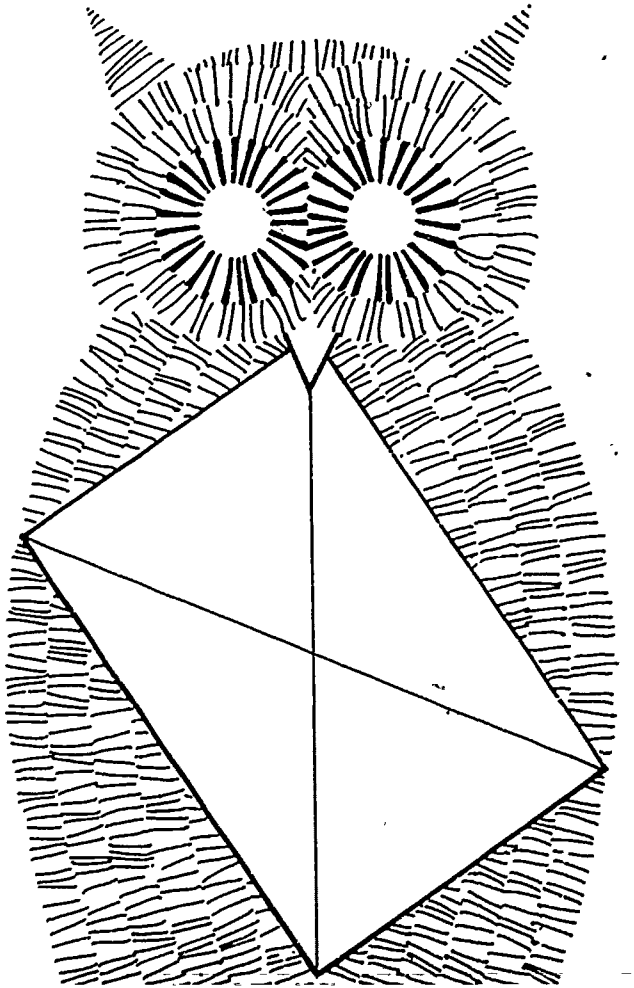
Data from the files of 1,417 students who were registered in correspondence courses at the NKI School in Norway from 1967-1968 were analyzed to acquire a general view of some problem areas in correspondence instruction. The areas of focus were recruitment, persistence, students' reasons for discontinuance, and correlations between background and criterion variables. The findings include the following: persons enrolling to attend home study courses at the NKI School appear to be in a situation of prolonged period of study; for most of the students, a relatively small number of years have elapsed since their last school experience; NKI School attracts most students from towns and industrial areas while rural areas are underrepresented; the student body consists practically of male students only; generally, the discontinuance rate is high; no relations were found between discontinuance and domestic background; discontinuance is most frequent in the preliminary stages of the course; discontinuance reaches its peak rates during the months April to July; and there are clear relations between the background variables of age, previous education, and number of years since the last school experience and important criterion variables regarding study progress and accomplishments. (EM)

Torstein Rekkedal

Correspondence Studies

Recruitment, achievement and discontinuation

CONDENSED AND ABRIDGED



Cover: Creative Service A/S

Printed in Norway by
Heglands Boktrykkeri, Flekkefjord

PREFACE

This book is a condensed and abbreviated report from a survey conducted at the NKI School in Oslo during 1970—71.

In this version we have omitted the major part of the theoretical introduction. These were chapters that presumably might reduce the accessability of the report to many readers who else might be interested in various problems discussed and the results obtained.

The NKI School has chosen to publish this abbreviated version of the report in English, based on the assumption that the problems raised contain elements of some general interest.

We hope that our contribution might help clearifying some of the problems related to correspondence education.

CONTENTS

Preface 3

INTRODUCTION 7
Data collection and sampling 7
Design and methodological problems 8
Definition of the variables 9
Statistical analysis 11

RECRUITMENT 13
Distribution of geographical recruitment 15
Sex distribution 17
Age 18
Previous education 18
Years since last school experience 19

PERSISTENCE 21
Status of the NKI students 2.5 years after enrolment 21
Number of days as an active student 22
Quantitative accomplishments 24
Relations between type of domestic are and discontinuance 27
Relations between the seasons of the year and discontinuance . . 28

REASONS FOR DISCONTINUANCE GIVEN BY THE STUDENTS . . 30

Summary of the findings from the survey of persistence 32

THE CORRELATION STUDY 33
Introduction 33
Age 36
Previous education 39
Years since last school experience 41
Length of courses 43
Relations between dynamic variables 44
Summary of the correlation study 48

CONCLUDING REMARKS 49

BIBLIOGRAPHY 50

INTRODUCTION

The NKI School was started in 1961. From the very start, emphasis has been put on technical subjects, and the school offers correspondence courses in various branches of technology at various levels. The courses vary from smaller ones of 19 study units (brev, lessons, Briefe) up to about 600 study units, equalling 2 years of full time studies in technology above G.C.E. "A" level. Laboratory training and examinations are given under NKI supervision.

Research in correspondence education is obviously lacking in Norway. It is becoming essential that more research is done in this area to provide necessary guide lines for this rapidly growing means of instruction.

The purpose of this study was to acquire more information and understanding of some of the important problem areas in order to reach a starting point for more systematic research. Consequently, we have designed this project as a pilot study intended to shed some light upon these four areas, which we believe are of considerable interest:

1. Recruitment to correspondence courses at the NKI school.
2. Persistence.
3. The students' own reasons for discontinuance.
4. Correlations between important background variables and certain criterion variables.

Data collection and sampling

To answer the relevant questions in these areas, we needed information about the students' background and how they succeeded in their home study courses. We had two main possibilities to get the necessary data. We could use the school's files, or we could construct a suitable questionnaire for a postal survey.

We chose to use the files as a result of the following considerations. Firstly, a postal survey takes time — probably more time than we could allocate for data collection. Secondly, questionnaires by mail usually produce rather poor response rates. In particular from students who felt like failures we could expect moderate enthusiasm only. The great problem facing us was the known fact that non-response is not a random process, and consequently, the resulting sample would be biased. Thirdly, the files apparently contained information that could be used for research purposes.

Nevertheless, the use of available file data has certain drawbacks. Files rarely contain exactly the type of information needed by the research worker, and as a result the

available data may determine the inquiry. The opposite situation is more desirable, i. e., that the researcher formulates questions and hypotheses based on theoretical considerations which determine which data should be collected. In this study, however, the questions already were formulated, and we found that the file information could be used to investigate them.

We were primarily interested in sampling a group of individuals who was representative for "all correspondence students at the NKI school in Norway". The subjects ought therefore to have been chosen at random from this population or universe. But as the study was not to concentrate on recruitment only, we could not sample at random from the universe of "all registered correspondence students". To get a measure of achievements and persistence, we had to look a few years back. For practical reasons we chose to sample every student (except enrolments through the armed services) enrolled for one of the NKI School's more than 100 technical courses on different levels during one year, from 1/6-1967 — 31/5-1968. A complete year was chosen because correspondence students, unlike students attending full-time classes, can enrol at any time of the year. It seemed likely that different types of students might enrol at different times of the year. The sample consisted of 1417 students registered during the period chosen. This is certainly not a probability sample. This is why no statistical tests of significance have been used in this study (except two "goodness of fit" tests). Statistical generalizations from the results of this study are therefore not possible. Any generalizations must be done on the basis of logical analysis.

Design and methodological problems

The inquiry can be characterized as an ex post facto study, in which some of the questions and results — on recruitment, persistence and reasons for discontinuance — are presented as a descriptive survey, while problems concerning relations between variables are treated by means of correlation techniques.

Ex post facto methods can never lead to reliable conclusions about cause-effect relationships. To the extent that control can be exercised of other variables which may cause certain correlations, one may assume a cause-effect relation between the two variables measured. It is, however, important to underline that a correlation coefficient is a measure of functional relationships only, and not of causal relationships which can

only be revealed through careful experimentation.

If one, for example, should find a relation between age and achievement in correspondence study indicating that older students obtain lower marks, it could not be concluded that the marks are lower **because** the students are older. It may well be that the older subjects as a group have received less education, and that this fact is the reason for poorer achievements. On the other hand, their lower marks may be caused by quite other variables or groups of variables. The point is that one can never exercise control on all possible cause-effect relationships.

In this study we have tried to control as many variables as were found necessary and possible in each correlation between two variables. Thus we have calculated a single correlation coefficient for every possible combination of values for the control variables.

The basic considerations leading to our handling of the data in this way are:

a. When two variables are correlated, the introduction of a third variable may nevertheless lead to the disappearance of the correlation.
b. When two variables are uncorrelated, the introduction of a third variable may lead to the appearance of correlations.

Definitions of the variables

The term "variable", which has been used earlier, refers to a unique property by which the members of a group differ one from another. It is a symbol to which we assign numerical values. In this study there are three types of variables.

Background variables are properties characterizing subjects prior to their reaching the situation under inquiry Classification of the students according to their **domestic background** will be given later under the heading "Geographical recruitment". **Age** has been defined by the birthday in the year of enrolment. **Previous education** has been analysed carefully in the original report and divided into one category for technical/vocational schooling and another for general schooling. In this condensed report we have decided to present previous education only as this variable has been handled in the correlation study. Here we assigned two values to this variable which is meant to measure all previous education: 1) Less than "0" Level (Junior high school or about 9-10 years of general theoretical schooling) and 2) "0" Level or more. **Years since last school experience** is defined by the number of years

which have elapsed since the individual last attended school or finished a home study course.

Situation variables are properties whereby the subjects differ only when they are in the situation which is examined. In this study there is one situation variable, namely **length of course.** This variable is defined as the number of study units included in the correspondence course. In respect to length of course, some students are excused from the introductory study units because of their previous education. As a result, we arrive at two different definitions of length of course. **Gross length of course** — the number of study units included in the school's original design, and **net length of course** — the number of study units the student is expected to work through after his exemptions have been subtracted. In the correlation study we have consistently used the variable net length of course.

Criterion variables are measures of any kind of the subject's achievements in the situation under consideration. **Status** is defined by the student's relation to the school exactly 2.5 years (900 days because we counted 30 days per month) after his enrolment. As most of the courses are very comprehensive, we could not expect that many of the students would have completed their studies during this relatively short period of time. Consequently, we assigned three values to this variable 1) **Completed:** The student has worked through all study units. All lessons have been submitted for correction and comments, and the student has received his final marks. 2) **Active:** The student is still working on his home study course, and he submits lessons at different intervals (at least one lesson in the last two months). 3) **Discontinued:** Either the course has been cancelled at the request of the student, or he has simply stopped submitting lessons and quietly disappeared without reacting to the school's approaches by cancelling the course or by starting his studies again.

Number of days as an active student is defined as the interval in days between time when the student received his first study material and the day when he submitted the last completed lesson. All students who are still active 2.5 years after enrolment have been given 900 days on this variable.

Number of lessons completed is defined as the number of study units, the test papers of which the student has replied to and mailed to the school for correction and comments before dropping out, before completing — or for active students — before the elapse of 900 days.

Achievement is measured in marks which the student has received for his written assignments. The marks differ from 1.0 (highest) to 6.0 (lowest). In this study, the criterion variable, achievement, has been measured in two ways. First, the mean marks for the first ten submitted lessons. Second, the mean marks for all completed lessons. **Rate of submission** is defined as the number of days per submitted lesson. We have counted 30 days a month. Therefore, the rate of submission for active students has been calculated as 900 days of studying. Here we have defined a uniform measure, too — i.e. the number of days used by the student to complete the first ten lessons.

Statistical analysis

Today, we have many statistical methods at our disposal for both descriptive and analytic purposes. The various methods are based on different assumptions about the data. The convention is to speak of higher levels of measurement, the more of the mathematical properties can be interpreted. The higher levels of measurement put severe and restrictive demands on the data. As a result of careful analysis, we found that the variables at hand did not satisfy the extraordinarily rigorous assumptions underlying the higher levels of measurement. Consequently, we decided that methods based on the nominal and ordinal scale properties were most appropriate. At the nominal level, numbers or scale values serve only to keep what is different apart and join together what is considered to be equivalent. At the ordinal level, the numbers also serve to order the elements in terms of some relation, and one value can be interpreted as "more than" ("greater than") or "less than" ("smaller than") another. As an example, sex is a nominal variable with two "values" (man and woman), while teachers' ratings of their pupils' achievements constitute an ordinal variable. In one terminology it can be said that one pupil with the mark "A" is better than the one who has received the mark "B". But the ordinal scale can never tell how much better or anything about equality of differences. The ordinal scale can only order objects or individuals on a dimension.

We have used the statistical techniques which we found most suited to our data. When we deal with variables on the nominal level, we calculate frequencies and percentages only. We have also used χ^2 tests to see whether a distribution fits a theoretical distribution ("chi-square one sample test" or "goodness of fit test").

For correlational purposes we have calculated a coefficient of correlation called Goodman-Kruskal's gamma (γ) developed some fifteen years ago. Gamma is strictly based on the assumptions underlying the ordinal scale family.

RECRUITMENT

Those students sampled for this inquiry were, as mentioned above, 1417 individuals enrolled in one of the NKI School's different courses during one year. They were distributed on 14 different branches of technology and more than 100 different courses. The courses consisted of from 19 to about 660 study units. The students' distribution on length of courses is illustrated in Fig. 1.

The white bars show the distribution on gross length of course. Many students were exempted from some of the introductory study units because of their former schooling. The shaded bars illustrate the distribution after exemptions have been subtracted i. e. net number of study units of the course. It is the net length of course that has been called length of course in the correlation analysis. The logic behind the classification into these eight groups lies in the organization of the different courses at the NKI School, and this is believed to be of no interest here.

The median (measure of the central location) of the gross length of course distribution, Md is 192.6 study units, and the quartile deviation (measure of dispersion), Q is 159.5 study units. While the median of the net length of course distribution is 182.0 study units and the quartile deviation is 145.2 study units. We observe that the NKI students enrol for relatively comprehensive and extensive courses, requiring long completion time. We must assume that in order to complete these courses, the students need to posess the qualities of high level motivation and persistence.

When correspondence tuition is being discussed, it is usual to point to its special abilities in reaching individuals who suffer from economic, geographical, social or physical handicaps. This advantage is obviously very important and is often claimed to be the main reason why this method is accepted as an educational means. To some extent, we believe this to be correct. Nevertheless, the correspondence schools attract students whom we naturally would assume to enrol in ordinary day- or evening classes. Among other things the correspondence schools recruit several students living in districts where they are free to choose traditional tuition, in spite of the fact that ordinary schools are often free of charge and that the correspondence schools have to charge considerable fees. More than fifteen years ago, Østlyngen found that Norsk Korrespondanseskole (NKS) (The Norwegian Correspondence School) in proportion to the population recruited nearly twice

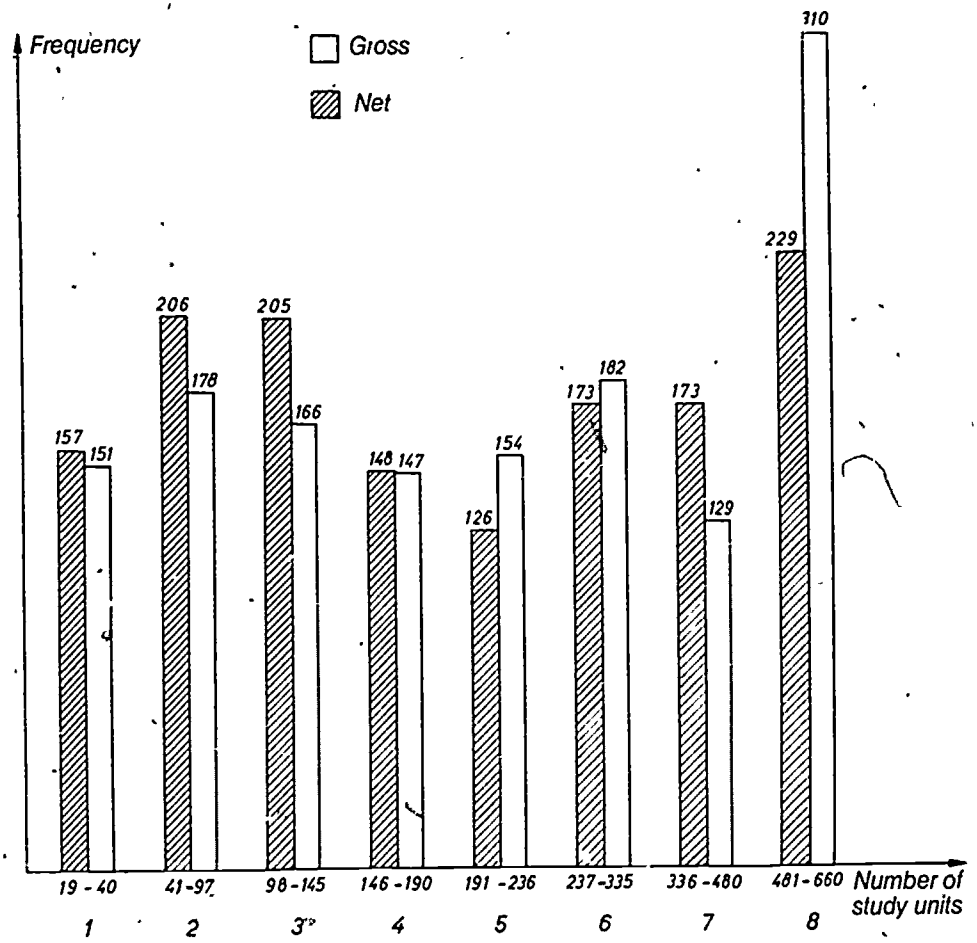


Fig. 1. The students' distrihution on gross and net length of course.

as many students from the cities as from the rural areas of Norway. In an extensive survey among adults, Nilsen found about the same time that rural dwellers more often than their counterparts in the cities were studying by correspondence. Statistics from the last years, a least in Europe, seem to indicate that in terms of instruction by home study methods urban areas are overrepresented in terms of recruitment.

Inquiries also indicate that there are more men than women among the correspondence students. Statistics from NKS gathered about twenty-five years ago show that the sex distribution is about 5 (men) to 1 (women).

Our impression is also that surveys show that the age distribution among correspondence students is skewed and that a great number of students belong to age groups that usually seek traditional schools. In the above mentioned statistics from NKS, more than 65 percent were 30 years or younger, while only about 17 percent aged more than 30 years. Survey studies in Europe and the USA can perhaps be summarized by concluding that the major part of the student body (60-80 %) is less than 30 years old.

In this study we hoped to gain some knowledge about the recruitment pattern to the technical subjects offered by the NKI school. How are the students recruited geographically? What does the distribution among the sexes look like? And to what extent does the age distribution fit what we could deduce from known statistics? Furthermore, we were interested in acquiring knowledge about the students' former education in terms of general schooling and of technical/vocational schooling and of the period of non-study activity, i. e. years since last school experience.

Distribution of geographical recruitment

To start with, we examined the geographic dispersion of the students' domicile. Of the 1417 individuals constituting our universe, 1320 were living in Norway, 3 were living abroad, and 94 were sailors at sea. We assume that the subject of recruitment from the various parts of Norway is of comparatively little interest in this presentation. We will therefore only present the conclusions considered to be of greatest importance. We have used a "goodness of fit" test to analyse the accordance between the observed and theoretical (calculated from the census statistics) distributions of recruitment from various parts of the country. We have divided the country into six main regions, further sub-

divided into a total of twenty different counties (fylker). In this manner we have obtained two different significance tests. Both tests were statistically significant at the .001 level. Oddly enough, the two in all respects different regions, the central Oslofjord area and the three northern counties, were overrepresented, while most other regions were underrepresented.

What we assumed to be more interesting, was the recruitment to correspondence study at our institution in relation to degree of industrialization and urbanization of the students' residence municipalities. We categorized all districts in Norway in accordance with the following definitions:

Urban areas: Municipalities which in terms of administration have town status.

Suburban areas: At least ⅓ of the working population has permanent work in the nearest town.

Industrial areas: At least 50 percent of the working population is employed in mining etc., industry, building and construction work, power and water supply.

Other densely populated areas: Densely populated, non-urban municipalities which do not satisfy the requirements of the two categories mentioned above.

Primary occupation' municipalities: At least 50 percent of the working population is employed in one of the primary occupations. (Primary occupations: Agriculture, forestry and fishing).

Other sparsely populated areas: Municipalities where less than 50 percent of the working population is employed in the primary occupations.

To be classified as either suburban areas, industrial areas or other densely populated areas, more than 50 percent of the inhabitants of the municipality will have to be residents in villages with populations of more than 200 persons. To be classified as either primary occupations' municipalities or other sparsely populated areas, less than 50 percent of the population must reside in such areas.

The recruitment to home study courses at the NKI School seems according to Table 1 to confirm the previously mentioned tendencies. Most students are recruited from urban areas. **Towns and industrial areas are overrepresented among the students, while all other types of areas are more or less underrepresented.**

The percentages showing over- or underrepresentation are included in

Table 1. The students' domestic background given by recruitment from different types of municipalities. (97 students who were sailors at sea or residing abroad are left out.)

Type of municipality	Observed (O) Freqv.	Perc.	Theoretical (T) Freqv.	Perc.	O-T	$\frac{O-T}{T} \cdot 100\ \%$
Towns	684	51.9	564	42.7	120	21
Suburban areas	119	9.0	123	9.3	÷4	÷3
Industrial areas	79	6.0	64	4.8	15	23
Other densely populated areas	37	2.8	44	3.3	÷7	÷16
Primary occupations' municipalities	74	5.6	126	9.5	÷52	÷41
Other sparsely populated areas	327	24.8	399	31.5	÷72	÷18
Total	1320	100.1	1320	100.1	0	

the extreme right column of Table 1. Towns and industrial areas show about twenty percent overrecruitment, while municipalities where the majority of the population is employed in the primary occupations are heavily underrepresented. The NKI School's offer of courses would probably justify the expectation of these results. Of the 1320 students resident in Norway, 341 come from the three largest towns of Oslo (246), Trondheim (55) and Bergen (40) respectively, while 343 students are living in other towns. That is to say, 684 students (51.9 %) come from urban areas with town status, while only 42.7 percent of the Norwegian population are living in these regions. We see that rural areas are underrepresented. Statistical computations give $\chi^2 = 64.74$. With 5 degrees of freedom, this value for chi-square is significant at the .001 level.

Sex distribution

The NKI students show an extremely biased distribution among the sexes. Of the 1417 students represented in this survey, 1390 (98,1 %) are male and 27 (1.9 %) are female. Our institution obviously recruits

more men in proportion to women than would be expected from other known statistics, and this must be a result of our technical curriculum. In Norway, as in most other countries, however, the technical vocations still attract far more men than women.

Age

The students' distribution by age is illustrated in Table 2. We observe that the students concentrate in the lower age groups. 577 (40.7 %) students are 20 to 24 years of age. 886 (62.5 %) are in their twenties. Only 244 students (18.3 %) are 30 years or more. This corresponds to most know facts about age distribution among individuals working with this method of tuition.

Table 2. The age distribution in the enrolment year

Age	Frequency	Percentage	Cumulative percentage
15-19 years	244	17,2	17,2
20-24 years	577	40,7	57,9
25-29 years	309	21,8	79,7
30-34 years	136	9,6	89,3
35-39 years	75	5,3	94,6
40-44 years	42	3,0	97,6
45-62 years	34	2,4	100,0
Total	1417	100,0	

Previous education

In the original report we worked hard to give a satisfactory description of the students' earlier schooling classified under both technical/vocational education and general education. Here we present a short and simplified description of the students' former education. 42 individuals gave no information about which level of education they had attained. Perhaps these students had received the compulsory primary education only and found no reason to mention this. On the other hand, 140 students (9.9 %) stated that previously they had completed primary school (7 years) only. About one half of the subjects (683) had received a total previous education equalling "0" Level or Junior high school (Realskole), while 692 students had not reached this level before enrolling. 126 individuals had taken exams equivalent to that of the G.C.E. Advanced Level or more.

With respect to technical/vocational training, 627 (44.2 %) had received no such education earlier, while 30 students had in fact attained a level of education equalling the NKI School's most comprehensive courses (ingeniør), but then of course, in another area of education or another branch of technology.

Years since last school experience

Are persons entering correspondence courses those who for a longer period of time have received education, and for whom home studies represent a natural extension? Or have they been employed in different occupations during the past few years and then suddenly decided to try to attain higher qualifications and salaries through correspondence studies? There may be reason to believe that persons who have attended school recently, choose traditional classroom training, while adults who have been out of school for several years, will more often choose home study methods. As most of the students belonged to the younger groups, one must assume that they have been out of school for a relatively short period of time. The distribution of years since last school experience is given in Table 3.

We see that 483 individuals (34.1 %) have recently left other schools. In other words, they pass more or less directly from traditional schoolwork to home studies at the NKI School. For 923 student (65.1 %) 5 years or less have elapsed since they last attended school regularly, while only 403 students (28.6 %) left school more than 5 years ago.

We conclude, therefore, that persons enrolling to attend home study courses at the NKI School appear to be in a situation of prolonged period of study. For most of the students, a relatively small number of years have elapsed since their last school experience. Nevertheless, we see that the correspondence courses also attract persons who have not been in a schooling situation for quite some time. 185 of the students who gave information had not attended school during the last 10 years.

Table 3. Years since last school experience

Years since last school experience	Frequence	Percentage
No information given	91	6,4
0- 1 years	483	34,1
2- 3 years	269	18,9
4- 5 years	171	12,1
6-10 years	218	15,4
11-15 years	95	6,8
16-20 years	53	3,8
21-30 years	25	1,7
31-43 years	12	0,9
Total	1417	100,1

In view of the variables examined, this seems to be the complete picture of recruitment to the NKI school's correspondence courses: Our institution attracts most students from towns and industrial areas. Rural areas particularly, characterized

by many people employed in the primary occupations, are underrepresented among the students. The student body consists practically of male students only. There are very few women. In their previous education erceived, approximately one half of the student body has not reached an "0" Level, and the other half has attained about this level of education or more. Most of the students have allowed a very short period of time to elapse between their last school experience and their enrolment in the correspondence courses.

We may probably state that the recruitment to the NKI School does not confirm what many people seem to believe about the profile of home students: that correspondence students are older adults resident in rural areas offering few or any alternative provisions for further- and adult education, and who are trying to qualify for better jobs by means of home studies after many years of full-time employment.

We suppose that our description of the student profile does not decrease the importance claimed for correspondence tuition among the many different educational provisions of today. Correspondence education makes further education possible for people suffering from different handicaps which prevent them from regular school attendance. At the same time, however, this method is accepted with enthusiasm by persons who are obviously free to choose among different educational institutions and methods.

PERSISTENCE

The basic problems of adult education emerge from the following two characteristics — voluntary enrolment and voluntary attendance of participants. This means that the pattern of attendance in most adult education programmes shows a sporadic, but persistent decline. We have to admit that a major cloud on the horizon is the fact that so many people who ardently undertake study, so soon abandon it. Many of the reasons given for discontinuance in different survey studies indicate that even if the educational institution were perfect, a considerable number of students would drop out because of problems to which the school can give no solutions. Some students reach their goals before the course or sequence is completed and see no need to continue. Some have too low basic academic aptitudes, while others encounter problems in their private lives which prevent continued attendance.

In fact, we must, however, realize that the institutions can and must make actual efforts to improve the situation. Correspondence courses are generally advertised, and they may be over-advertised or misleadingly advertised, thereby attracting persons who are unable to profit from the instruction or who are seeking knowledge such as the courses are not intended to provide. Some students may be dissatisfied with the instruction. Others may be dissatisfied with administrative policies and procedures. Furthermore, we must admit that many adults enrolling for correspondence courses do not know how to learn.

The drop out rate among those who study by correspondence is high. But is the drop out rate higher among correspondence students than among students following other adult education programmes? Statistics about rates of wastage in adult evening classes and correspondence courses seem to indicate that this is not the case. Usually, we find that drop out figures vary from 30 to 80 percent, depending on how enrolments and drop outs are defined. Most research reports show that the drop out rate is high in the preliminary stages of the study. Many students seem to be discouraged by the apparent magnitude of the course. It is not unusual to find that 10 to 20 percent or more of the enrollees do not even submit one lesson.

Status of the NKI students 2.5 years after enrolment

In this survey we examined what the students had accomplished during 2.5 years of home study work. We examined each single individual exactly 2.5 years after he had received his first study material. The re-

Table 4. The students' status 2.5 years after enrolment

	Status			
	Discontinued	Active	Completed	Total
Frequency	1085	283	49	1417
Percentage	76.6	20.0	3.4	100.0

sult, which at first glance is not encouraging, is shown in Table 4.

We see that the drop out rate is high, but scarcely higher than we should have expected. We have used the most strict and conservative measure of discontinuance. All individuals who had filled in the application form and had stopped submitting assignments without completing the number of study units they enrolled for, are categorized as discontinued. Pfeiffer & Sabers (1970) found that among correspondence students, 76.4 percent dropped out before completing the final lesson in a 32 lesson course. Only 3.5 percent of the NKI students had enrolled for courses as small as that.

As most of the courses were fairly comprehensive, it is not remarkable that only 49 students had completed their courses during this time. 23 of the 49 students who had finished their courses, had moved on to higher levels of study. Of the 283 students who were still active, we found that 11 had in fact completed their studies, but had changed to a more comprehensive course just before they were to submit their last assignments. 60 students had, in fact, completed the amount of work for which they enrolled originally, and 34 (56.7 %) of these continued their education by correspondence towards higher qualifications. In terms of teaching, it may be more efficient to encourage prospective students to enter smaller courses so that we perhaps may prevent the magnitude of possibly difficult material from discouraging them. They will then be able to see their goal not too far ahead, and they may then build up their competence successively.

Number of days as an active student

Other surveys have pointed to the high drop out rates in the beginning of a course. The discontinuance curve representing the NKI students is shown in Fig. 2. This is a curve of negative cumulative frequencies, where the axis of abscissas measures number of days as an active student.

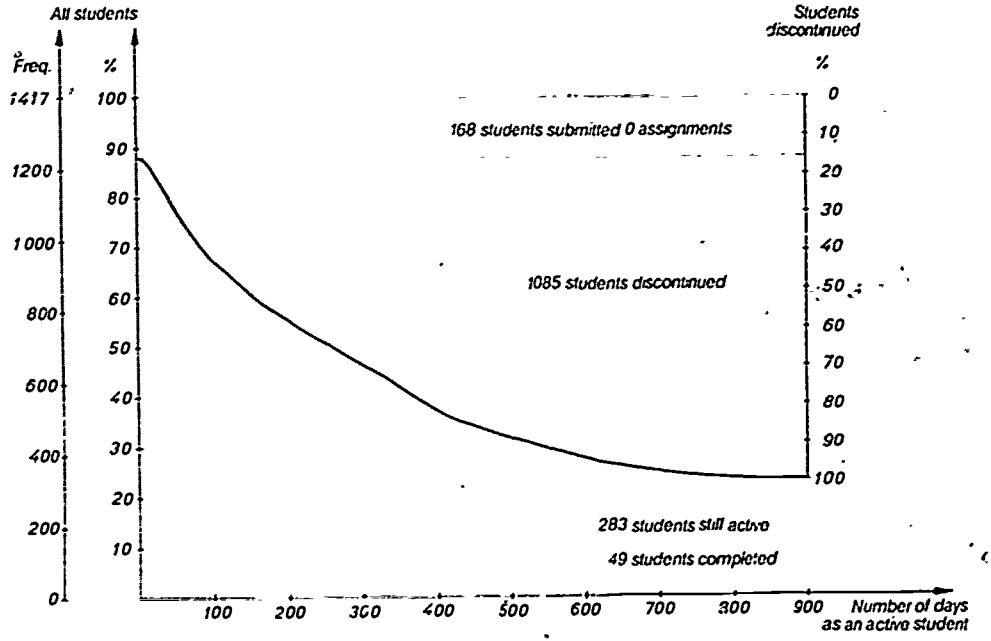


Fig. 2. Curve showing the negative cumulative frequencies for the number of days as an active student.

This variable is hardly a good measure of what the student has accomplished, but it tells us for how long he regards himself a correspondence student. The illustration shows that 168 individuals (11.9 %) did not even submit one single assignment. They have been assigned 0 days on this variable. (Ought we speak of them as students?)

These 168 individuals constitute 15.5 percent of those who abandoned the courses. Half of the students who discontinued had submitted their last lesson before their 150th day of study, while 75 percent of them had submitted their last work before the elapse of one year. The median of the number of days as an active student calculated for students who discontinued during the first 2.5 years after enrolment, Md

= 147.0 days, while the quartile deviation, Q = 153.0 days. Discontinuance measured in time units is at its highest rate in the very beginning of a course, and the curve levels out after a while. We examined the students' status at about 3 years after they had enrolled, and we found, in fact, more active students now than we had about half a year before. (It is possible for students defined as discontinued here to resume their study.)

Quantitative accomplishments

It may be that the student's quantitative accomplishments measured in number of lessons completed are better indicators of his degree of success or failure.

Net length of course for students completed. 49 students completed their courses during the first 2.5 years of study. In terms of magnitude, their courses varied from 23 to 279 study units. As expected, the courses completed were relatively small. Md = 66.3 study units, and Q = 14.4 study units.

Number of lessons completed by students still active. The 283 students still active have all studied for 2.5 years, but they have still not terminated. There are considerable differences between these individuals' quantitative accomplishments. The total dispersion of "lessons completed" by these students extends from 5 to 369 study units. Md = 60.8 study units, while Q = 30.1 study units. We observe that the dispersion is somewhat greater in this group, while the median is found a little lower. These results point to the importance of letting adult students work at their own speed. As many students obviously proceed too slowly to complete their courses in a reasonable length of time, it seems that some may need the social climate of a classroom as a motivational force.

Number of lessons completed by students discontinued. We found it more interesting to examine the quantitative accomplishments of the students who had dropped out from their courses. We assume that the number of study units submitted by these students, give some kind of measure of the tuition received. In this group, the total dispersion of the variable "number of lessons submitted" extends from 0 to 165 assignments. As previously mentioned, 168 individuals did not submit any lessons at all. Md = 8.3 study units. Q = 10.1 study units. The majority of the students who discontinued their studies, did so during the very first lessons. One half submitted less than 9 assignments, but we should also note that many students who discontinued, in fact have carried

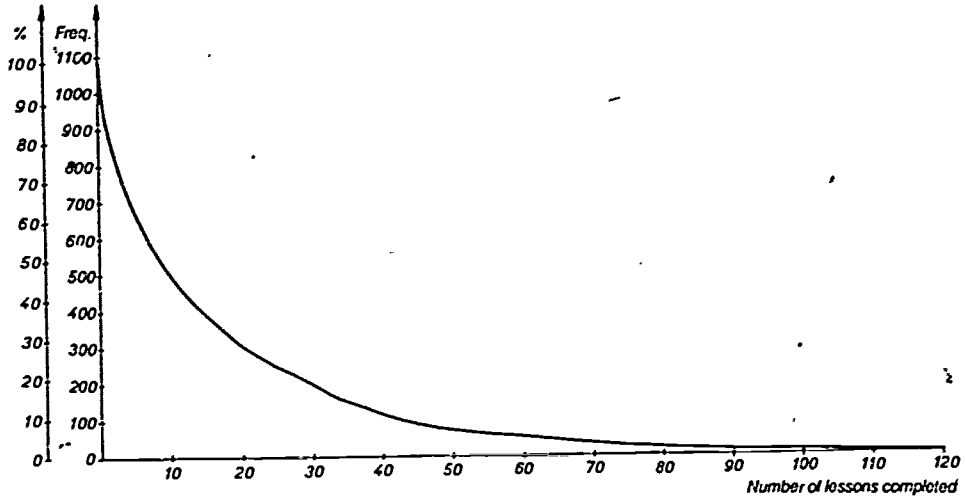


Fig. 3. Curve showing negative cumulative frequencies for number of lessons completed by the 1085 students who discontinued during the first 2.5 years. Minimum completed lessons are 0. Maximum completed lessons amount to 165.

out a considerable amount of work. Fig. 3 illustrates a polygon of negative cumulative frequencies of number of lessons completed by these students.

Number of single courses completed. The more or less extensive NKI courses examined in this survey are, in fact, made up of a few or many smaller, but complete, courses in different disciplines and subjects. These smaller courses (called single courses) may be considered as complete units of work. Complétion of a single course qualifies for a final mark in this area of a subject. We were interested in examining the students' completions of single courses. We suppose that this variable makes a better basis for comparisons between discontinuance figures from this and other surveys. The median length of these single courses is about 7 study units. Table 5 shows the distribution of number of completed single courses for the 1417 enrollees.

Table 5. Number of single courses completed for all students enrolled.

Number of single courses completed	Frequency	Percentage	Negative cumulative Frequency	Negative cumulative Percentage
0	497	35.1	1417	100.0
1	216	15.2	920	64.9
2	110	7.8	704	49.7
3	91	6.4	594	41.9
4	58	4.1	503	35.5
5	64	4.5	445	31.4
6	35	2.5	381	26.9
7	43	3.0	346	24.4
8	31	2.2	303	21.4
9	39	2.8	272	19.2
10	25	1.8	233	16.4
11—15	96	6.8	208	14.7
16—20	47	3.3	112	7.9
21—30	39	2.8	65	4.6
31—65	26	1.8	26	1.8
	1417	100.1		

In Table 5 we consider the two columns on the right to be the most interesting. These figures illustrate the frequency and percentage of enrollees who have completed the respective number or more of single courses. 920 student (64.9 %) have completed at least one single course. 73.7 percent of all persons who started their studies (defined by the submission of their first assignment), worked through at least one single course. 591 (54.5 %) of the students who discontinued, completed one single course or more (not shown in Table 5). We observe that most of the students can be said to have gained something from their investment of time and money, but there is still much to be done before the situation is satisfactory. Nevertheless, discontinuance will always occur. In a Norwegian survey on adult evening classes, the researcher concludes that one can possibly never minimize the discontinuance rate to less than 25 percent in a twelve session course (Nilsen 1963).

Relations between type of domestic area and discontinuance

We thought it possible that some types of home areas could exercise a stronger motivating effect on home studies than others because of schools, present population structure or predominant trades in the area. It is also possible that the mail service is unsatisfactory in some of the most far away outskirt districts. The mail service is particularly unsatisfactory to correspondence students living outside Norway, and to sailors at sea. We have examined the relation between the type of students' domestic areas and discontinuance, where sailors and persons living abroad were considered to belong to a category of their own. We may call them students abroad. The result is illustrated in Table 6, which shows practically no relationship between the students' domestic background and discontinuance.

For all students living in Norway, the discontinuance figures vary from 71.4 to 77.5 percent, while the students abroad show a considerably higher drop out rate. 88 (90.7 %) of the students living outside Norway dropped out during the first 2.5 years of study. We think that there is reason the believe that both the study

Table 6. The relation between the domestic area and discontinuance.

	Status				
	Discontinued		Not discontinued		
	Freq.	Perc.	Freq.	Perc.	Total
Abroad	88	90.7	9	9.3	97
Towns	519	75.9	165	24.1	684
Suburban areas	85	71.4	34	28.6	119
Industrial areas	62	77.5	17	22.5	79
Other densely populated areas	27	73.0	10	27.0	37
Primary occupations' municipalities	56	75.7	18	24.3	74
Other sparsely populated areas	248	75.9	79	24.1	327
Total	1085	76.6	332	23.4	1417

Table 7. The relation between month of enrolment and the tendency of failure to submit lessons.

	Started submitting lessons		Did not start submitting lessons		
	Freq.	Perc.	Freq.	Perc.	Total
January	122	89.1	15	10.9	137
February	134	85.9	22	14.1	156
March	113	82.5	24	17.5	137
April	64	81.0	15	19.0	79
May	67	89.3	8	10.7	75
June	44	77.2	13	22.8	57
July	38	95.0	2	5.0	40
August	70	89.3	8	10.2	78
September	132	94.3	8	5.7	140
October	167	90.7	17	9.3	184
November	196	90.7	20	9.3	216
December	102	86.5	16	13.5	118
Total	1249	88.1	168	11.9	1417

conditions and the mail service are unsatisfactory for sailors studying by correspondence. Nevertheless, some of these students delivered respectable amounts of solid work, and 44.3 percent of all students abroad completed at least one single course during the period of 2.5 years or before discontinuance.

Relations between seasons of the year and discontinuance

We have mentioned before that 168 individuals who enrolled in the course of one year, did not submit even one lesson. Are there any relations between the month of enrolling and failure to commence? Table 7 illustrates the distribution of all enrolments during the twelve months of the year, and it shows on a monthly basis how many students failed to submit any lesson.

We shall observe that there is a greater tendency to drop out before submitting their first lesson among students enrolled during the spring months. The percentage of non-starters is high in December, too.

The situation during the autumn months looks much better. The autumn is possibly a propitious period of time for beginning studies.

We also recorded the month of discontinuance for the 917 students who started to submit their first assignments, but who all the same dropped out after a while. With regard to these students, too, does any systematic relationship exist between season of the year and discontinuance? Here the time of discontinuance is defined by the submission of the last assignment. We used a chi-square goodness of fit test to evaluate how the distribution of discontinuance during the twelve months of the year fitted at theoretical distribution. To find the theoretical distribution (or distribution of expected frequencies), we recorded the mean total number of submitted assignments to the school every month in a three year period. If the students' study activity, measured by the total number of submitted test papers to the school for correction, differed from month to month, we found it reasonable to assume that the number of last lessons submitted from students dropping out would vary accordingly. The results are given in Table 8. $\chi^2 = 58.68$. For 11 degrees of freedom, this value of chi-square is statistically significant at the .001 level. We conclude that there is some systematic relation between month of the year and discontinuance. From column O-T we see that discontinuance is most frequent in the spring and early summer, while the figures are lower than expected in the autumn and early winter.

Table 8. Month of discontinuation for students who have submitted at least one lesson for correction.

	Observed (O)	Theoretical (T)	O-T
January	72	87	÷15
February	101	97	4
March	96	97	÷1
April	100	85	15
May	111	71	40
June	77	55	22
July	48	39	9
August	35	51	÷16
September	49	75	÷26
October	72	92	÷20
November	86	98	÷12
December	70	70	0
Total	917	917	0

REASONS FOR DISCONTINUANCE GIVEN BY THE STUDENTS

The primary purpose of this part of the survey was to attempt to ascertain some of the reasons for failure to complete correspondence courses at the NKI School. It has previously been noted that most drop outs in correspondence study cease to submit assignments for reasons totally beyond the control of the teachers and the institution administering the course. The reasons for discontinuance among the NKI students were given either on direct questions from the student councelors or on the students' own initiative when cancelling the course. The reasons given are presented in Table 9.

568 (52.4 %) of the 1085 drop out students explained their reasons for non-completion, while 517 individuals (47.6 %) gave no reasons. We judge this "response rate" to be about as high as we could expect to obtain on a question like this. Sloan (1965) received 18 percent filled in questionnaires from former correspondence students who had not completed their courses. In our case, a questionnaire by mail would perhaps give more selective and biased results than we actually obtained.

It is likely that there is a considerable difference between the group of students giving reasons for non-completion and the students giving no explanation. Most likely we would find more feeling of failure among individuals in the last group as well as more persons having difficulties in expressing and communicating their attitudes and problems to others.

We see, too, that reasons beyond the control of the faculty are dominant among the causes of dropping out given by the NKI students. As shown in most surveys, discontinuance is often due to lack of time. We should also notice that many students change from correspondence work to other methods of study. Correspondence instruction is unfortunately quite expensive, and some students have economic problems. Examination of reasons given, made us conclude that at least 61.5 percent of the causes were beyond the immediate control of the NKI School.

Very few students state that they have difficulties with content of course, methods of study or the Swedish language. Because the NKI School orginally was a Swedish institution, many of the courses have still not been translated into Norwegian. (The difference between the Norwegian and Swedish languages is in most cases considered to be quite minute.) Curiously enough, a minimal body of drop outs express dissatisfaction with the institution, material or tuition received. Some

Table 9. Reasons for non-completion. 568 students gave a reason, while 517 gave no reason. The percentages are based on the number of students who explained why they ceased to submit lessons.

Shortage of time, job required too much time, and so on	123	21.7 %
Changed to other school work (40 of these startet to study at the NKI's evening schools)	102	18.0 %
Economic reasons	69	12.1 %
Major changes in plans for the future	32	5.6 %
Illness	29	5.1 %
Building my own house	29	5.1 %
Unsatisfactory living and/or study conditions	20	3.5 %
Military service	18	3.2 %
Personal/private reasons	17	3.0 %
Marriage	16	2.8 %
Course found too difficult	14	2.5 %
Service by mail not satisfactory	13	2.3 %
Problems in connection with enrolment	12	2.1 %
Have trouble with the Swedish language	10	1.8 %
Joined the merchant navy	9	1.6 %
Illness in the family	7	1.2 %
Correspondence methods did not suit me	5	0.9 %
Lost interest	5	0.9 %
Reproaches against oneself	5	0.9 %
Dissatisfaction with the school, corrections of test papers. tuition or course material	5	0.9 %
Problems in the family	4	0.7 %
Left the country	3	0.5 %
Other reasons	21	3.7 %
Reasons given by 52.4 percent of 1085 students discontinued	568	100.1 %
Reasons not given by 47.6 percent of 1085 students discontinued	517	

students drop when they are called to attend their military service, even though the armed forces will pay the fees of the recruits, so that they may study free of charge.

9 students dropped out when joining the merchant navy. This may be considered to be a valid reason for discontinuance, because study conditions on board a ship are likely to be unsatisfactory, as testified by the high drop out rate among sailors. The 13 students complaining about mail services were all sailors.

Here we remark that the reasons given for discontinuance, are the reasons stated by the students. In this study, we had no possibilities to examine whether the students were telling the whole and unbiased truth. Even when a student believes that he is honest, we cannot be sure whether the stucent's understanding of this own motives are thorough and correct. We think there is reason to believe that more students really have difficulties in their studies than the impression given by the figures in Table 9.

SUMMARY OF THE FINDINGS FROM THE SURVEY OF PERSISTENCE

The NKI students confirm our impression from previous research on adult and correspondence education, that generally the discontinuance rate is high. 2.5 years after enrolment, 1085 students (76.6 %) had ceased to submit lessons, 283 (20.0 %) were still active students, and 49 (3.4 %) had completed their studies. We found no relations between discontinuance and domestic background — except that the incidences of dropping out were more frequently found among sailors and individuals living abroad. Most drop outs submit none or very few assignments — discontinuance is most frequent in the preliminary stages of the course (measured both in terms of number of days as an active student, and in terms of number of lessons submitted). 50 percent of the students who dropped out, delivered their last test paper before the elapse of 150 days, and 50 percent of these students dropped out before the ninth lesson is completed.

We should notice that 64.8 percent of all students enrolled (54.5 percent of the drop outs) have completed at least one single course.

There seems to be an influence from the seasons of the year that makes it more difficult to start studying in the spring months and in December, while discontinuance reaches its peak rates during the months April to July. Fewer students submit their last lessons during autumn and winter.

THE CORRELATION STUDY

Introduction

So far we have presented a decription of the student body by enrolment statistics, and we have examined the problem of discontinuation for its own sake and in relation to other factors. We have also given the reasons for drop out as given by the students.

In this section of the inquiry, which is designed as a typical ex post facto study, we tried to examine the relations between different variables thoroughly through calculation of coefficients of correlations. Measures of correlation are conventionally defined to take the values ranging from $\div 1.00$ to $+1.00$. A value of $\div 1.00$ describes a perfectly negative relation, one variable decreases as the other increases. A value of $+1.00$ describes a perfectly positive relation, one variable increases as the other increases. A value of 0 describes the absence of a relation. One variable is independent of the other or bears only a random relation to it. Measures of correlation take positive values where the relation is positive, and negative values where the relation is negative.

In this study we have used a measure of correlation suggested by Goodman and Kruskal called Gamma (γ). This measure is extremely simple and generally applicable to all two-dimensional distributions of ordinal variables.

Control variables. Through the whole study we have tried to exercise control of other variables which could influence correlations between two variables. In the first place we excluded, from all correlations, the 27 women, 15 men enrolled by their employer, the 97 students in the merchant navy or who were living abroad, and 91 students who did not give information on all the background variables. Because some students belonged to more than one of these categories, 218 students were excluded. The correlation study is, therefore, based on 1199 individuals.

When examining the correlations, we tried furthermore to control other variables which we assumed could affect the direction and value of correlations, i. e. we calculated a coefficient of correlation for each combination of values of the control variables. We will then obtain from 4 to 18 different coefficients of correlation for each relation between two variables, (dependent on the number of control variables and the number of values of each variable). We found it impossible to present all the coefficients on which the conclusions are based in this condensed report.

We interpreted the correlations according to the following considera-

tions: Our examination of the total impression from each table. (There were 34 tables like the one shown in Fig. 4.) The number of positive and negative coefficients counted in each table. Coefficients with values $+.10 > \gamma > \div.10$ were not counted, so that coefficients of minute values should not influence the results. All coefficients equalling or higher than +.10 were assigned the value +1, and all coefficients equalling or lower than ÷.10 were assigned ÷1. We named the sum of these values "the sign value of gamma", G_s, which then could vary from minus the number of coefficients to plus the number of coefficients. In the table shown in Fig. 4, there are 15 positive values higher than .10, but no coefficients of lower value than ÷.10. Consequently, $G_s = +15/18$. We write +15/18 because the sign value is/based on 18 combinations of values on the control variables.

Beside this measure, we also calculate the mean value of all gamma coefficients, called "the mean value of gamma", G_m. The conclusions will be based on G_s, because this measure gives the over all relation between the two variables with respect to the direction of the correlations. We must, however, treat the results with special care (and attention) if G_m has the opposite sign of G_s.

Relations between independent variables. In the correlation study we have regarded the background variables of **age, previous education, years since last school experience,** and the situation variable, **length of courses,** as independent variables. A demonstrated correlation between one of these and the dependent variables of **achievement** (marks), **status, number of lessons submitted, number of days as an active student** and **submission-rate** does not necessarily imply a causal relationship. The correlation may for instance come out as a result of correlations between two or more independent variables. The correlations between the independent variables are presented below.

Age — previous education are negatively correlated. The lower age groups have reached a higher educational level than have the older subjects. $\gamma = \div.17$.

Age — years since last school experience are positively correlated. Subjects in the higher age groups have naturally been out of school for longer periods of time. $\gamma = .65$.

There is a minor positive relation between **age** and **length of courses.** The older subjects show a tendency to enrol for longer courses. $\gamma = .10$.

Previous education — years since last school experience show a negative relation. The lower educated

Correlation between previous education and number of days as an active student.

Independent variable:	Education 2–values (L) Less than "0" Level, (H) "0" Level or more.
Dependent variable:	Number of days as an active student 3–values. (L) 0–100, (M) 101–450, (H) 451–900
Control variables:	Age 3–values (L) 15–21 years, (M) 22–26 years, (H) 27–62 years
	Years since last school experience 2–values (L) 0–2 years, (H) 3 years or more
	Length of course 3–values (L) 19–140, (M) 141–280, (H) 281–660

$G_s = +15 \quad G_m = .35$

Values of the control variables				
Age	Years since last school experience	Length of course	n	Gamma
(L)	(L)	(L)	124	.49
(L)	(L)	(M)	103	.49
(L)	(L)	(H)	104	.32
(L)	(H)	(L)	44	.57
(L)	(H)	(M)	28	.08
(L)	(H)	(H)	23	.41
(M)	(L)	(L)	44	.59
(M)	(L)	(M)	49	.30
(M)	(L)	(H)	93	.67
(M)	(H)	(L)	83	.34
(M)	(H)	(M)	94	.43
(M)	(H)	(H)	79	.04
(H)	(L)	(L)	13	.60
(H)	(L)	(M)	30	.09
(H)	(L)	(H)	30	.11
(H)	(H)	(L)	88	.44
(H)	(H)	(M)	82	.22
(H)	(H)	(H)	88	.19

Fig. 4. Example of a table of correlations. Because of the control variables, the coefficients of correlation are calculated for 18 different groups.

subjects have been out of school for more years. $\gamma = \div .50$.

There is a positive relation between **previous education** and **length of course.** $\gamma = .24$.

There is a minor and negative relation between **years since last school experience** and **length of course.** Students who have been out of school for more years tend to enrol for shorter courses. $\gamma = \div .12$.

Formulation of hypotheses. Writers on educational research methods often recommend formulations of hypotheses or predictions. This method of work will especially tend to enhance the possibility of reaching valid conclusions from ex post facto research designs. Correlation methods of inquiry may without hypotheses lead to wrong and invalid conclusions. Consequently, we have tried to formulate predictions of results through the entire correlation study. These hypotheses, as we may call them, are here simply expectations. They are based on educational and psychological theory and findings from previous studies.

Age

For a long period of time the prevailing and popular belief in society has been the following: As the individual progresses from early maturity to old age, his mental faculties deteriorate, and this is particularly the case with his ability to learn and remember. This pessimistic stereotype concept with regard to the aging individual has been challenged and modified by psychological research during the last century. Research results seem to indicate that no substantial quantitative reduction in learning ability takes place, at least not until in the later adult years. Many studies, however, point to qualitative differences in ways of attacking intellectual problems between age groups. Constitutional factors put individual limits, but psychological factors such as experience, attitudes and interest play an important part in the learning activities. The awareness of the risk of failing may partly explain the aged person's reduced confidence and his slower performance in most problem solving situations. He requires more information before he is willing to make a decision and take action. We also know that the sensory functions deteriorate as the individual grows older. This may impair his ability to interact with his external environment. Research workers agree, however, that younger and older adults, as well as children and youth, may profit from a teaching-learning situation.

Age and achievement. By achievement we here mean the results of learning experiences measured by the marks given the student on his

test papers. Previous research seems to have found no significant relations between age and achievement in this connotation. In a report from a study conducted in the USA, Knox and Sjogren (1965) concluded "that among adults who participated in college level adult education courses, age by itself was not related to achievement as measured by course grades". Sorenson (1930) found only a very slight inverse relation between age and achievement. In a study among correspondence students, Donehower (1968) found that the oldest group (only 9 students more than 60 years old) received the lowest marks. Except for these oldest students, the achievement rose with increasing age of group, at least up to about 45 years of age. In our study the students are divided into three age groups (15-21 years, 22-26 years, 27 years or more (the oldest student was 62 years old)). The students' achievements are measured in two ways — the mean of the marks received on all completed assignments, and the mean of the marks received on the ten first assignments submitted. In the first case the mean of the marks is calculated on the basis of a different number of lessons. We tried, therefore, to control the influence of the variables, **years since last school experience, previous education and number of lessons submitted.**

Hypothesis: There is no correlation between age and achievement as measured in marks.

Findings: Both correlations are definitely positive. The figures are also relatively high. For all lessons completed, $G_s = +9/12$ and $G_m = .36$. For the ten first assignments, the correlations between age and marks give $G_s = +4/4$ and $G_m = .30$.

Comments on the results: Among the NKI students there appears to be a pronounced positive correlation between age and achievement. The oldest students receive the best marks. These results do not confirm the expectations. The result may come from the fact that even in the oldest age groups, most subjects are not very old. It is probable that persons in their thirties or older have a stronger sense of responsibility and hesitate to submit assignments before they are satisfied with their test replies.

Age and persistence. Here, too, we have to try to generalize from research among adults studying in classes. Verner and Davis (1964) have reviewed thirty studies on the subjects persistence and discontinuance among adult students. Eleven studies compared the students on the basis of age. Five of these found no difference between those who

persisted and those who discontinued. Five studies disclose that young subjects drop out more frequently than older ones. One study indicates a drop out rate far above the average with students under the age of eighteen.

Knox and Sjogren (1965) examined seven institutions, and they report a significant correlation between age and the variable, **drop complete,** in only one of these. Here, the older students discontinued more often. Dickinson and Verner (1967) report statistically significant differences between drop outs and persistent attenders with respect to age in adult night school classes. Among the correspondence students in her study, Donehower (1968) found that, except for two age groups, which changed places in rank, the ratio of completions to withdrawals increased as the age of the students increased.

In our study we have divided the variable of **status** into three categories — namely **discontinued,** active and **completed** — due to the fact that data were collected 2.5 years after enrolment. In the correlation study we treat the variable as a two value ordinal variable. **Discontinued** is assigned the lowest value, and the categories **active** and **completed** are assigned the highest value. Consequently, all students who have not discontinued, are considered as "better" than the students who dropped out. This decision is obviously not logical for all aspects of the students' accomplishments and persistence in their study activities. Therefore, we have introduced two other measures of persistence: The number of assignments submitted and the number of days as an active student.

Hypothesis: We expect to find a positive correlation between age and status. There are fewer cases of discontinuance among the older students. We expect the variables, **number of assignments submitted** and **number of days as an active student** to show the same tendency in relation to age.

Findings: The correlations between age and status are mostly positive: $G_s = 10/12$ and $G_m = .32$. The relations between age and number of days as an active student are also positive: $G_s = +8/12$ and $G_m = .19$. The correlations between age and number of lessons submitted give $G_s = +6/12$ and $G_m = .15$.

Comments on the results: Among the NKI students there is a pronounced positive relation between age and status. The drop out rate for older subjects is far below the average. Measured in time units and in units of course material, older students show a higher persistence, too.

These results confirm to our predictions.

Age and rate of submissions. When comparing intellectual abilities among different age groups, reference is often made to the fact that older persons show poorer performance on speeded tests. We do not believe that the tendency for older persons to work more slowly, will influence the submission rate of their home study lessons. Even if they work at a slower speed in a problem solving situation, they may, nevertheless, submit lessons at the same or even at a higher rate than do younger students.

Hypothesis: We do not expect any conspicious correlation between age and rate of submissions. Provided a relation should exist, the correlation will presumably be a positive one.

Findings: Here, too, we applied two different measures of the dependent variables — **rate of submissions based on all completed lessons, and number of days required to complete the ten first lessons.** The correlations differ in magnitude and direction. Regarding correlations between age and rate of submissions, most coefficients have rather small values, and $G_s = +2/12$, while $G_m = .00$. The other measure gives $G_s = +4/12$ and $G_m = .13$.

Comments on the results. Among the NKI students there are insignificant relations between age and rate of submissions. With respect to the preliminary stages of study, older students tend to proceed a little faster than younger ones, as shown by the relation between age and time required to complete ten lessons.

Previous education.

Longitudinal studies of adults often show larger age increments in intellectual abilities among individuals who have continued their education to a high level or whose occupations are "academic" in content. It seems clear that schooling develops and maintains skills, interest and attitudes, which are important prerequisites for continued learing.

Previous education and achievement. Studies with the purpose of throwing light on this relationship, seem to lead to the conclusion that previous level of schooling is important in determining performance level in part-time adult education. Positive correlations between these variables have been found in studies among adults studying in classes (Knox & Sjogren 1965) and among correspondence students (Donehower 1968).

Hypothesis: Among the NKI students there are positive relations between the students' previous education and their achievements (marks).

Findings: In the correlation study

previous education is divided into two categories — "less than "0" Level" and "0" Level or more". The correlations between **level of previous education** and **achievement** (the mean marks received on all lessons completed) are definitely positive. Sixteen of the eigtheen coefficients carry a positive sign. $G_s = +13/18$ and $G_m = .33$. Relations between previous education and achievement on the ten first assignments give $G_s = +6/6$ and $G_m = .40$.

Comments on the results: The NKI students confirm the assumption that there is a positive relation between previous education and achievement, and this reveals the same pattern of behaviour as displayed by students in other learning situations. The results suggest that previous learning activity is crucial in preparing the individual for continued studies.

Previous education and persistence. Many studies have investigated the relationship between educational attainment and the tendency to drop out. The usual findings indicate that students with more education show a more persistent attendance in adult evening classes, while some results point to the fact that students with an extremely high educational background drop out at an above average rate. (Verner & Davis 1964; Knox & Sjogren 1965; Bø 1962; Donehower 1968). In the computations of correlation coefficients we have not selected students with "extremely high education" in a group of their own. We used three different measures of persistence — **status, number of days as an active student,** and **number of lessons submitted.**

Hypothesis: We expect positive correlations between level of previous education and all these three variables.

Findings: Computations of coefficients of correlation between level of previous education and status give 13 positive and 5 negative coefficients. $G_s = +9/18$ and $G_m = .22$. Relations between previous educational attainment and number of days as an active student are also definitely positive. $G_s = +15/18$ and $G_m = .35$. Regarding number of lessons submitted, previous education seems to be of considerable significance. The measures of these relations give $G_s = +18/18$ and $G_m = .39$.

Comments on the results: There are positive correlations between previous education and all our measures of persistence. Students in the higher educational group seem to drop less often. They are in any case more persistent, whether this tendency is measured in time units or in units of study work completed. In addition to the correlation study with its numerous control variables, we

also examined the percentage of drop outs in the eight original educational groups. We found that the percentage of drop outs decreased as we ascended the educational ladder.

Previous education and rate of submissions. We have found no other studies attacking the problem of rate of study in relation to different background variables among correspondence students. Nevertheless, we assume that students who were unfamiliar with a study situation will encounter more difficulties, and thus tend to proceed at a lower rate.

Hypothesis: We expect positive relations between the level of previous education and the rate of submissions. We also expect the more highly educated persons to finish their ten first assignments in a shorter period of time.

Findings: Apparently, there are no correlations between level of education and rate of submissions. $G_s = +1/18$ and $G_m = .03$. There is a small, but positive relation between education and number of days required to complete the ten first assignments. $G_s = +6/18$ and $G_m = .06$.

Comments on the results: The reason for the absence of correlations between level of education and rate of submissions may be that better educated individuals often wish to be exempted from some of the preliminary lessons and thus start their study at a more difficult level. This explanation may be incorrect, because students in the higher educational category seemed to proceed faster at the beginning of the course. We must conclude that no correlations between level of previous education and rate of submissions are displayed.

Years since last school experience

There is reason to believe that not only the level of education, but also recency of learning activities, will be decisive factors that will determine a person's performance in a teaching — learning situation. Houle (1964) put forward the hypothesis that one important reason for discontinuance is the fact that many adults have forgotten how to study. They are not capable of handling this situation, which is unknown to them.

Years since last school experience and achievement. In 1930, Sorenson presented his "disuse hypothesis" based on research among adults. He came to the conclusion that a possible measured mental deterioration with age was not a result of declining mental ability, but primarily due to inefficiency in method of study because of lack of experience. Knox and Sjogren (1965) found no signi-

ficant correlations between the number of years since the last school experience and level of marks received. Halfter (1962) found no relationship between these variables in a study among women, and she assumed that Sorenson's hypothesis is not valid for persons who are sufficiently motivated to enrol for studies after long periods of non-study activity.

Hypothesis: We think there is reason to believe that there is an inverse relationship between years since last school experience and course marks. (If this hypothesis proves to be correct, the coefficients of correlation will carry negative signs.)

Findings: Both measures of achievement — the mean marks received for all lessons submitted and the mean marks for the ten first lessons were positively related to years since last school experience. The first measure gives $G_s = +6/18$ and $G_m = .08$, the second gives $G_s = +2/6$ and $G_m = .07$.

Comments on the results: The correlation coefficients are small, but strangely enough, both measures give relations between the variables contradictory to the logical assumptions. The students who have been out of school for a longer period of time receive better marks on their test papers submitted.

Years since last school experience and persistence. Studies in the USA indicate that adult participants in evening classes who have not attended school for a long period of time, seem to drop out more often than persons who have attended school rather recently (Verner & Davis 1964; Knox & Sjogren 1965). We have not found any examination of this variable among correspondence students.

Hypothesis: There are inverse relations between the number of years since the last school experience and persistence. Thus, there is a higher tendency to drop out among adults who have been out of school for a long period of time. We expect this tendency to prevail also with respect to the quantitative accomplishments (number of lessons completed) and persistence measured in time units (number of days as an active student).

Findings: There are pronounced negative correlations between the two variables — **years since the last school experience** and **status.** $G_s = \div 17/18$ and $G_m = \div .31$. The correlation between **years since last school experience** and **number of days as an active student** are negative, too. $G_s = \div 10/18$ and $G_m = \div .20$. The last measure of persistence also gives relatively marked negative correlations. $G_s = \div 15/18$ and

$G_m = \div .23$.

Comments on the results: All three computations of correlations give coefficients mostly carrying n tive signs. It seems obvious t recency of education is important ... preparing the individual for the particular learning situation that he will face in correspondence study.

Years since last school experience and rate of submissions.

Hypothesis: We expect negative relations between years since last educational experience and rate of submissions during the correspondence course.

Findings: We cannot demonstrate any relations here. $G_s = +.1/18$ and $G_m = \div .03$. Furthermore, there is not a negative relation between the number of years since the last school experience and the number of days required to submit the ten first assignments. Here, the coefficients give $G_s = 0/18$ and $G_m = \div .03$.

Comments on the results: The expectation was not confirmed. The results indicate that recency of educational experience seems to be important in determining whether a student will drop out or whether he will be able to handle a teaching-learning situation with pleasure. If individuals who have not attended school recently, choose to stay, they may perform well. If they do not cease to study, they seem to receive good marks and submit lessons at an average rate.

Length of courses

One can hardly expect courses of very different lengths to have the same effect on students' aptness to either discontinue or complete their studies.

Length of course and persistence. A study carried out by Pfeiffer & Sabers (1970), and which compared correspondence courses consisting of 8, 16, 24 and 32 study units, showed that the absolute number of students dropping out increased in pace with increasing length of course. Individuals studying larger courses, however, appeared to complete a larger number of assignments before dropping out. But note should be made of the fact that there were more non-starters among students enrolled for the longest courses.

Hypothesis: We find it reasonable to expect these tendencies to be exhibited by the NKI students, too. There will be a greater number of discontinuance incidents among individuals attending the largest courses. Nevertheless, these students will have completed a greater number of study units before dropping out or during the 2.5 years of study.

Findings: Due to the control variables, the correlation between course

length and status give 12 coefficients of correlation. The relation between these variables is comparatively faint, but shows a direction of inverse correlation. $G_s = \div 3/12$ and $G_m = \div .11$. There is only one coefficient of a value higher than +.10. There is a weak positive correlation between length of course and number of lessons submitted. $G_s = +5/12$ and $G_m = .11$.

Comments on the results: Both expectations were confirmed, although the correlations were relatively small. There is a tendency towards more students dropping out from the courses of greater length. During the 2.5 year study period or before dropping out, students enrolled for longer courses submit more assignments.

Relations between dynamic variables

The activity of teaching and learning is in some way or another a dynamic social situation. What happens to the learner is a result of interactions between two or more persons and some instruction material. In correspondence study, the teacher and the student will influence each other mutually through their work in writing. It would be very pessimistic to assume that a student's destiny in a study situation is determined by his previous knowledge, his personality and experience background only.

Here we are interested in examining relations between what we have called dynamic variables — i. e. **lapse of time between the date of enrolment and the first lesson submitted, submission rate** and **achievement**. We are also interested in examining relations between these variables and **status**. There may be causal relationships, but again we must underline the fact that correlations can never demonstrate this. This part of the inquiry was carried out only for courses consisting of more than 100 study units. This restriction was introduced in order to obtain more satisfactory control. The assumption is, that when courses consist of more than 100 study units, the length of course will no longer influence factors like discontinuance, rate of submissions or number of lessons completed.

Number of days required to complete the first lesson and persistence. Is it possible to predict discontinuance from the knowledge of lapse of time between enrolment date and the first lesson submitted? Donehower (1968) hypothesized that the longer the period of procrastination on part of the student, the less would be the likelihood of his maintaining the interest that prompted him to enrol in the course. She found a

clear relationship between the lapse of time between the enrolment date and the date of the student's submission of his first lesson, or unit, and whether he would complete the course.

Hypothesis: There is a relation between the number of days required to complete the first lesson and status. We expect a higher percent of students discontinued among those who require longer time to complete the first assignments. We also expect that students who start quickly, will complete more study units than students who take a longer time to start submitting lessons.

Findings: Correlations between number of days required to complete one lesson and persistence give $G_s = 9/11$*) and $G_m = .01$ Relations between number of days required to submit one lesson and number of lessons submitted give $G_s = +10/12$ and $G_m = .35$.

Comments on the results. There is no relation between the lapse of time between the date of enrolment and the first lesson submitted and status. Curiously enough, this variable does not predict discontinuance as concluded in Donehower's study. However, since there are marked correlations between the number of days required to complete the first lesson and number of lessons submitted, it seems to predict a rate of progress — how far students will reach before they discontinue or in a given period of time.

Rate of submissons and achievement. In correspondence courses, the feed-back concerning achievement and performance is continuous and may tend to encourage students of high-quality academic skills, and discourage students of lower abilities. The marks are likely to influence the individual students in different ways. Donehower (1968), who was thinking in terms of cause-effect relationships, concludes that the time used to complete a course has no significant effect on the students' achievement, as reflected in the marks received. The same relationships were examined by Pfeiffer & Sabers (1970), who found that the best marks were earned by those who completed in one month or took more than two years to complete, while those taking medium time to complete, received medium marks. Among the NKI students we shall examine the relations between rate of submissions and achievement for all students whether they have com-

*) One of the groups in this part of the study consisted of 8 persons only, who all dropped. It is thus impossible to calculate coefficients of correlation for this group when status is one of the variables

pleted, have discontinued or are still active.

Hypothesis: There will be a positive correlation between rate of submissions and achievement.

Findings: The correlations show a positive tendency. However, 6 of the 12 coefficients of correlation is 0, or practically 0. $G_s = +4/12$ and $G_m = .10$.

Comments on the results: We must conclude that the relationship is positive, but relatively weak. The lack of a stronger relationship does not seem to be caused by a curvilinear correlation.

Rate of submissions and persistence. Possibilities for different rate of study is one of the distinct features of correspondence education. Students may proceed at their own speed, depending on their abilities and time allocated for study purposes. Some of the courses offered by the NKI School are considerably large. Sooner or later, the student will obviously discover which rate of progress he has to match in order to complete the course in a reasonable period of time. Some students will discover that they proceed too slowly, and they will tend to be discouraged. We assume that some of these most likely will drop out after a while.

Hypothesis: We expect to find correlations between rate of submissions and status. The students who have discontinued, will have proceeded at a lower rate. We also expect a positive correlation between rate of submissions and the total number of lessons submitted by students who have discontinued their studies.

Finding: We cannot demonstrate any relations between rate of submissions and status. The computations give very small coefficients carrying both positive and negative signs. $G_s = +1/11$ and $G_m = .03$. Among students who discontinued, there is a marked relationship between the rate of submissions and the total number of lessons submitted. $G_s = +12/12$ and $G_m = .66$.

Comments on the results: The lack of demonstrated relationship between rate of submissions and status may probably be explained by the fact that students who completed and students who were still active, have studied for a longer period of time. It is perhaps not reasonable to expect that these students, even if they have proceeded at a high frequency rate in the preliminary stages, will make this rapid progress during more than two years. The results illustrate, however, that students, even if they decide to discontinue, will complete a greater part of their courses before dropping out if they

Table 10. Summary of correlation study results

Variables correlated	Number of groups	f+	f−	G_s	G_m	Expected correlation	Expectation confirmed
Age with							
Achievement	12	10	1	+ 9	36		
Achievement (10 first lessons)	4	4	0	+ 4	30	0	No
Status	12	10	0	+10	32	+	Yes
Number of days as an active student	12	8	0	+ 8	.19	+	Yes
Number of lessons completed	12	6	0	+ 6	.15	+	Yes
Rate of submissions	12	4	2	+ 2	00		
Rate of submissions (10 first lessons)	12	6	2	+ 4	13	0	Yes
Previous education with							
Achievement	18	15	2	+13	33		
Achievement (10 first lessons)	3	6	0	+ 6	.40	+	Yes
Status	18	13	4	+ 9	22	+	Yes
Number of days as an active student	18	15	0	+15	35	+	Yes
Number of lessons completed	18	18	0	+18	.39	+	Yes
Rate of submissions	18	6	7	+ 1	−.03		
Rate of submissions (10 first lessons)	18	8	2	+ 6	.06	+	No
Number of years since previous school experience with							
Achievement	18	11	5	+ 6	08		
Achievement (10 first lessons)	6	3	1	+ 2	07	−	No
Status	18	0	17	−17	−.31	−	Yes
Number of days as an active student	18	1	11	−10	−.20	−	Yes
Number of lessons completed	18	0	15	−15	− 23	−	Yes
Rate of submissions	18	6	5	− 1	− 03		
Rate of submissions (10 first lessons)	18	7	7	0	−.03	−	No
Length of course with							
Status	12	2	5	− 3	− 11		Yes
Number of lessons completed	12	5	0	+ 5	11	+	Yes
Number of days required to complete 1 lesson − Status	11	2	2	0	.01	+	No
Number of days required to complete 1 lesson − number of submitted lessons	12	11	1	+10	35	+	Yes
Rate of submissions − achievement	12	5	1	+ 4	10	+	Yes
Achievement − status	11	8	2	+ 6	17	+	Yes
Achievement − number of lessons completed	12	8	1	+ 7	19	+	Yes
Rate of submissions − status	11	4	3	+ 1	03	+	No
Rate of submissions − number of lessons completed	12	12	0	+12	66	+	Yes

try to submit lessons at a relatively high frequency rate.

Summary of the correlation study

The correlation study demonstrates that there are clear relations between the background variables of age, previous education, number of years since last school experience, and important criteria regarding study accomplishments. Some of the criterion variables are correlated too, even when we try to control for the influence from other variables. It seems likely that an interaction between these dynamic variables takes place. Table 10 gives a summary of results gathered from this part of the study. The column **number of groups** explains how many groups emerge due to the control variables. f+ is the frequency of coefficients carrying positive signs, and f÷ is the frequency of negative signs. Coefficients lying between .10 and ÷.10 are counted as 0, but all coefficients were included in the calculation of G_m. Further $G_s = (f+) \div (f\div)$.

CONCLUDING REMARKS

The study that has been reported, resulted from interest in examining some of the problems facing people engaged in correspondence instruction. The study was designed more or less as a pilot study, where we tried to acquire a general view of some problem areas, rather than examine one single question in greater depth. These areas were primarily recruitment and persistence. However, in this last part of the study, we computed coefficients of correlation between several variables, which we found to be of interest.

The survey confirmed our impression from the literature on adult education, that discontinuance is the big problem. The fact that the drop out rate is at its peak at the beginning of a course, indicates that this is the time when the intensive counselling and guidance of students must take place. The study furthermore confirms that age, previous education and the number of years since the last school experience seem to be important variables for predicting study progress and accomplishments. When giving students advice, care should be taken to meet the students' individual requirements. However, we need much more detailed knowledge about each single individual to give him correct advice and to predict his future performances with a higher degree of accuracy.

We consider it important to confirm whether tendencies of the results of this study also will be exhibited in distant teaching, where the content differs from our technical curriculum. It is also considered to be important to examine sociological variables like social status, marital status, number of children, housing conditions etc. Furthermore, we should find it interesting to investigate any relations between reasons for enrolling (motivation) and discontinuance.

We believe that there is a need for longitudinal surveys in correspondence education (Glatter & Wedell 1971). There is also a great need for carefully designed experimental studies. Experiments may lead to more valid knowledge about the effect of different teaching methods, counselling services and administrative routines. It is important that changes in administrative procedures and teaching methods are based on empirical facts from try-outs more than on beliefs and intuition.

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