STUDENTS WHO STUDY CHEMISTRY: SOME AFFECTIVE ASPECTS OF UNDERGRADUATES

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ABSTRACT

First year student expectations of their forthcoming chemistry courses, the degree to which those expectations are realised, and their attitudes towards chemistry at the end of the year were examined by discriminant analysis. A total of 1,438 Students (Ss) drawn from three Belgian universities and taking twelve different major study subjects took part. Degree of satisfaction with the separate components of the chemistry courses, unlike the overall sense of satisfaction, does not seem to be a valid means of discriminating between their differing course needs. The same is true of their expectations. Any rejection of the development of abstract thinking in universities was found not to be the result of experience prior to university entrance. Attitudes towards chemistry alone also cannot be used as a means of discriminating between populations, although attitudes do correlate with the concordance between expectations and realisations. Evidence was also found supporting earlier work of others that negative attitudes toward science (in this case chemistry) are generated by pitching courses at too great a level of difficulty. Overlap of population interests indicates that the chemistry course needs of the students (Ss) could be met by four separate courses.

The aspirations of chemistry students in the final year of their undergraduate studies, but whose specialist fields differ, show far more similarities than differences. They all expect to gain the same knowledge and skills but through the study of, say, organic chemistry in the case of the organic chemists, and physical chemistry in the case of physical chemists. Their specialist choice appears to be determined more by their activity attitudes towards the various topics available to them than by their evaluative and potency attitudes (Neerinck and Palmer, 1979).

To what extent do these observations replicate across populations whose involvement with chemistry varies in degree, whose experience of the subject...
is less and, possibly, whose attitudes towards it are less favourable? These questions can be investigated through enquiries involving students whose major field of study is one other than chemistry. Will these students, and even those embarking on a major study of chemistry, have differences in attitudes towards chemistry that manifest themselves mainly in the activity components, or will the evaluative and potency components become equal or dominant influences? Do all students studying chemistry expect and get the same benefits from that study irrespective of whether or not it represents their major field? Do attitudes towards the subject matter vary as a function of the extent to which the expectations of the students are realised? Is it not likely that the more a student perceives expectations as being realised the better will be that student's attitude towards the course content? That is, should there not be attitude-behaviour congruence that will manifest itself in a positive correlation between attitude towards subject matter (in this case chemistry) and the degree of concordance between (chemistry) course expectations and realisations? Difficulty in discriminating between types of students on the basis of any one measure could be the result of insufficient information being available in that one measure. Cronbach and Snow (1977) argue that what is important in identifying the relationship between a student and his/her course are the interactions between student characteristics, course content, learning method etc., and that these interactions between aptitudes and treatments are complex. However, their own review of the field of A.T.I. (Aptitude-Treatment Interactions) offers little support for their hypothesis and this continues to be so (Palmer, 1979). Although A.T.I.'s may prove to be elusive, this does not detract from the appeal of considering students as multidimensional and that discrimination between groups is likely to be best achieved by considering many rather than a few of their attributes.

**Hypotheses**

The following hypotheses were put forward for examination. That it is possible to discriminate between students (defined by their major study subjects) on the basis of separately:

**HO(1)** their attitudes towards chemistry —

**Ho(1.1)** evaluative component,
**Ho(1.2)** activity component,
**Ho(1.3)** potency component,
**Ho(1.4)** considering all components simultaneously;

**Ho(2)** their expectations of their forthcoming chemistry course in terms of aims concerned with the acquisition of —