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ATHABASCA UNIVERSITY'S ACHIEVEMENTS IN SCIENCE EDUCATION

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This poster session will review what Athabasca University has achieved in terms of science education from its inception in 1970 until now. It will summarize the courses, years offered, enrollments, completion rates, and laboratory components. From the successes and failures, the presentation will infer what has been found that works and does not work (e.g. home lab activities, home lab kits, library materials, face-to-face labs, field workshops, optional exercises, credit transfer, partnerships). A handout will provide a detailed abstract and bibliography of all papers, abstracts, and presentations made in Athabasca University's science courses.

Offering science courses by distance education presents many challenges. Since the inception of Athabasca University in 1970, the science faculty members recognized that distance students were faced by many constraints. Accordingly, strategies were initiated to develop a quality curriculum that would provide both accessibility and flexibility. This paper describes the development of science courses at Athabasca University over the last 25 years. In order to evaluate the successes and evolutionary changes over the years, student enrollments and student attrition are discussed.

BIOLOGY COURSES

Science course delivery began at Athabasca University in 1973 with the formation of a 6-credit course in ecology (BIOL 201), which was offered with a very minor laboratory component. (A couple of years later, there was an optional six-day field workshop worth an additional credit.) This course was the only one in our history that was nearly entirely written and illustrated by our staff. Nearly all other courses were 'wrapped around' an existing textbook. Fourteen students originally registered in 1973, and nearly 250 in 1975. Registrations remained above 100 students over the next five years and then declined. The course was discontinued in 1988-89 after 14 years and over 1,400 students.

We tried a commercial introductory audio-tutorial course that required students to attend one evening and each Saturday. Not enough adult students could come twice a week to a designated place and the course failed. There were other attempts at introductory courses that led in 1995 to our present offering of three courses; two of which are completely home-study with home lab activities, and one has a 10-day in-person lab (BIOL 204/205/206). Although it is premature to present conclusions about trends in enrollments, figures appear promising, with initial enrollments exceeding 100, and numbers increasing each year.

The offering of physiology (BIOL 230/235) by distance education has proved to be popular among nurses and other students. Although the courses do not have lab components, they are transferable to other institutions and did attract over 500 students per year at their peak. Today, both BIOL 230 and 235 have total registrations exceeding 200 students. Except for BIOL 378: Human Sexuality, development of more senior courses in biological sciences (i.e. BIOL 341: Human Genetics - no lab; BIOL342: Animal Behaviour - lab; BIOL 401: Cell Biology - no lab) yielded lower numbers of enrollments. We speculate that these advanced courses are only of interest to students who want specific concentrations in biology. Some of our students use such courses as a convenient way of completing biology degrees by transferring these senior courses to other institutions. Now that we have a BSc and biology major, we are getting more students interested in senior courses.

PHYSICAL AND OTHER SCIENCE COURSES

The second science course to be offered was introductory chemistry. This was followed by courses in geology, physical geography, physics and astronomy - most with lab components. These also have shown similar trends in increase of enrollments, with courses in physical geography and chemistry being most popular. Except for astronomy and physics, greater than five-fold increases in enrollments occurred within 3-5 years of the first offerings. Most of these courses have labs that make them transferable to other institutions.

HOW SUCCESSFUL ARE OUR COURSES?

While enrollment numbers provide an indication of student participation in science courses, these data do not reflect the success of students. Thus, we examined the number of passes, failures and withdrawals. In all cases, withdrawal from courses was greater than 47% during the initial years of delivery of courses and has declined subsequently. Some of this decline has to do with penalties, or lack thereof, for students not completing courses but part also has to do with the recruitment of more serious students. Anecdotal evidence indicates that sometimes the distance learners' work or personal lives restrict them from completing a course in time (i.e. 6 months for 3 credits) and that they often re-register at a later date. Of the students who continued with their studies, more than 90% achieved a pass. This high pass rate is due to our procedure of students requesting their exams when they feel they are ready to write. The students who are not ready do not request exams.

WHAT HAVE WE LEARNT FROM THESE EXPERIENCES?

Data indicate that if science courses are offered by distance education, students will enroll and can be successful. As stated in related papers by our group, various methods, both traditional and novel, can be used to develop science courses delivered at-a-distance - including laboratory components. The content of these courses has been widely accepted as comparable to those offered by traditional universities and so transfer of credit is not a great problem. These courses have provided greater freedom for distance learners who otherwise could not continue their education because of work and personal responsibilities or geographical constraints.