**Distance Delivery of Graduate Education in Agricultural Economics for Middle and Low Income Countries**

**Final Report to the Farm Foundation – April 30, 2002**

**Peter Wyeth**[1]

## Purpose of the grant.

The purpose of the grant was, "To initiate a feasibility study for delivering distance education in agricultural economics at the masters and doctoral levels to developing and transitional economies"[2].

The proposal for this program was initiated by the National Association of Agricultural Economics Administrators (NAAEA), a section of the American Agricultural Economics Association (AAEA). An earlier grant from the Farm Foundation and the AAEA Foundation supported the drafting of a prospectus.

The work funded under the current grant has been primarily to assess potential demand, and secondarily to consider delivery issues. This report will also outline proposed next steps and show how grant funds have been spent.

## Potential demand

Demand has been assessed in two ways. The first has been through personal contacts with departments in medium and low income countries, mainly in Africa. The second has been through a formal sample survey of similarly defined countries world-wide, with roughly a quarter of respondents in each of Africa, the Americas, Asia, and Europe and the Middle East (17% in Europe and 6% in the Middle East). An appendix to this report contains a brief description of the survey and summary tables. A full survey report will shortly be available separately.

The following are conclusions regarding demand, with qualifications where results from the personal contacts and the survey differ. The survey sometimes found notable differences between respondents inside and outside universities, and the comments note these instances.

1. ***There is considerable interest in the program.*** Visits by Chris Barrett of Cornell University and Suresh Babu of IFPRI (International Food Policy Research Institute) to a number of agricultural economics departments in African universities established that the level of interest in these institutions was quite high (Babu 2001 and Barrett 2001). Richard Shumway also encountered a positive response when he presented the proposal at a workshop in Nairobi attended by African agricultural economists concerned with graduate education.

   A major focus of the Nairobi workshop was a study of 12 agricultural economics and 10 economics departments in 9 African countries that was presented at the Nairobi workshop. It found that departments were often understaffed (average establishment was 17 positions with

[1] International Programs, Washington State University. The content of this report has benefited from input from many persons, especially those mentioned in the references and Richard Shumway, Chair of the WSU Agricultural Economics Department and the NAAEA Distance Education Visioning Committee. A report like this and the work that went into it contain many judgement calls, and every deficiency remains that of the author.

[2] The terminology has been changed from developing and transitional economies to middle and low income countries simply because clear and well accepted definitions were found for the latter (in World Bank tables) and not for the former.

13 filled), and about half of faculty members were without PhDs. While firm data were hard to come by, indications were that the demand for agricultural economists with graduate degrees was strong and exceeding supply. (Obwona and Norman, 2001, and Proceedings of the Nairobi Stakeholder Workshop, including the presentation of Ms Jennifer Mpungu.)

No similar study has been found for other continents. In the worldwide survey, 41% respondents think that there would be a "great deal of interest" in making use of the program among academic staff, with another 40% expecting "some interest". Regarding students, respondents outside universities expect a higher level (51% a great deal of interest and 26% some interest) than those within them (33% and 46% respectively).

A plurality of respondents (49%) think that the impact on numbers of students going to the US or Canada for graduate degrees would be minimal.

2. ***There is interest both in taking degrees and in the possibility of taking individual courses.*** This emerges from both the personal contacts and the survey. In the latter, respondents expect faculty members to be interested in degrees and refresher courses to about an equal degree, with refresher courses slightly favored. Among students, interest is expected to be somewhat stronger in master's degrees and in individual courses than in PhDs.

3. ***There is demand both for core economics and quantitative courses and for applied courses.*** The personal contacts in Africa indicated that demand would be strongest for core courses. The survey results back this up, though respondents also expect substantial enrollment for some applied courses at the master's level, in particular Regional and National Modeling (e.g. input-output, CGE models) and Agricultural Production Economics. Means, medians and modes of expected enrollments are generally around 10 per country for master's students and 2 to 7 for doctoral students. Worldwide, this suggests that enrollment would be sufficient to bring about 15 of the 21 courses listed up to the enrollment of 25 students that has been temporarily adopted as a rule of thumb to indicate viability.

4. ***Indications have been mixed regarding support for degrees given by US or Canadian than by local universities.*** The impression gained from the personal contacts was fairly clear, at least in Africa, that universities wanted to make use of distance learning courses to supplement their own programs. PhD programs in Africa sometimes follow the British pattern and are thesis only, not requiring coursework, but the courses were seen as useful supplements to upgrade skills in particular areas. North American degrees, particularly doctorates, were seen as having the benefit of being analytically rigorous but the disadvantage of not being well adapted to the African context (Obwona and Norman, 2001, and Proceedings of the Nairobi Stakeholder Workshop).

   The survey gives a somewhat different picture. Among respondents in universities, 74% would probably or definitely support a program that resulted in degrees from a local university, while 84% would support the program if it gave degrees from a US or Canadian university. For respondents outside universities these percentages are 67% and 87%.

5. ***Signals concerning the desired role for local faculty have been even more markedly equivocal.*** Personal contacts in Africa definitely indicated that departments would like their faculty to have a substantial role in course design and delivery. At the stakeholders' meeting in Nairobi it was clear that participants wished to ensure that their courses would develop in ways suitable to their countries' needs and that distance courses should be delivered collaboratively.

On the other hand, no more than 36% of respondents to the survey, and generally much less, would give staff a role in teaching, leading tutorials, grading, setting exams, or supervising research. Seventy percent or more would give local faculty no role at all. Interestingly, respondents in universities were even less inclined to give faculty a role than those outside. On its own, this last point could be explained on the grounds that university personnel are not eager to take on more work because, with departments understaffed, they already have heavy teaching loads. The difference between the survey results and the opinions expressed by the African agricultural economists remains, but it may not be necessary to reconcile this divergence, as the proposed program could be flexible enough to allow some variation in the participation of local faculty.

6. ***If the program is delivered only over the Internet, some countries will not be able to take full advantage of it immediately.*** In the personal contacts, a number of persons made this point. Reinforcing this, over half of survey respondents said that Internet access in their country was either inadequate or expensive or both. The variation among continents is considerable, with Africa by far the worst off and Central and South America the best equipped (with the Internet adequate and affordable to 15% in the former and 64% to 70% in the latter). The survey asked how long it would be before access would be affordable and sufficient. Over 80% of respondents, even in Africa, said 5 years or less. Among respondents as a whole, 55% favored the Internet over CD-ROMs as a mode of delivery, while a large minority (39%) thought the latter would be better.

7. ***Unless demand is very high, users of the program will not be able to afford fees that cover costs.*** This was anticipated from the outset, underscored in personal contacts, and further supported by survey returns. The only fee level that respondents thought a majority of program users could probably or definitely pay was $250 for a three-credit course. Only 40% percent thought users could probably or definitely pay as much as $500 per course, and fees higher than that would exclude most potential users. Out-of-state fees for a three-credit graduate course at US land grant universities are currently in the neighborhood of $2,000. However, some universities do not charge the full non-resident rate for distance students.

**Delivery issues**

Though distance learning programs are many and growing, no evidence has been found of any program quite like this being undertaken before in any field. Other programs fall into two main categories:

1. Programs where cost recovery is possible because the users or their employers have a high ability to pay. Examples are the many MBA programs on-line, including successful master's degrees in agribusiness offered by at least two North American universities, Guelph and Kansas State.

2. Programs aimed primarily at broadening the number of students within the delivering institution's statutory catchment area (such as a state) and who can therefore be subsidized in a similar manner to residential students. Examples are the external degree programs that most land grant universities now have and the Western Governors' University.

The NAAEA program proposes that universities cater to the needs of students who are outside traditional catchment areas and who cannot come close to paying full cost. The closest example is Imperial College at Wye (previously Wye College) in the UK, which has been offering well respected, graduate level distance programs in agricultural economics to students worldwide

since 1988. However, Wye's fees (£6,940 or US$10,112 for a master's degree) are higher than those contemplated in this proposal, no doctoral program is offered, and Wye is the sole provider of the program, as opposed to the consortium of universities envisaged here.

The following are desirable features of the program with comments regarding their feasibility.

***a) Analytically rigorous.*** In principle this is the least difficult characteristic to ensure, as the program will have the best minds in the profession to draw on. The challenge will be to persuade these minds to contribute. Currently, work on related programs, directed beyond the traditional clientele of agricultural economics departments in North America, is not well rewarded in tenure and promotion evaluations. To a large extent the program will rely on self-selection from among faculty who see one or both of two very different opportunities: to support an intrinsically worthwhile effort and to broaden their reputations.

***b) Adaptable to varying local national contexts.*** Prior to receiving the survey results, the initial plan was to adapt course applications to local national contexts and issues through the participation of local faculty. The principle of local adaptability remains important, though its implementation will have to be rethought given the survey results showing that interest in any role for local faculty is limited to a minority. The program will have to be open to strong local participation where it is wanted and find other ways elsewhere to ensure local relevance. This is true not only for applied courses that focus on practical issues but also for core courses on theory and quantitative methods, where problem sets demonstrate the usefulness of techniques. In these instances the problems posed and data included can easily be drawn from a variety of middle and low income countries.

***c) Adaptable to the varying requirements of local universities and students.*** Many or most distance learning programs cater to participants who want full degrees as well as to those who want to make use of individual courses. A new program could begin by offering individual courses in high demand and gradually develop the full range of courses needed for a degree.

***d) Course material provided in a variety of media.*** Although the intention is that the proposed program be computer and, if possible, Internet based, this should be regarded as a matter of convenience and not one of doctrine. For example, making some course material available on CD-ROMs would be helpful beyond the fact that it is necessary, at least in the early years, in order to reach those countries with only poor or expensive Internet access. The Open University in Britain (which, with 200,000 students, is among the largest distance programs in the world) makes use of every kind of medium –Internet, television and radio broadcasts, video and audio cassettes, and CD-ROMs – and has researched student attitudes to them (Kirkwood, 2001). Among several useful findings is that students rated CD-ROMs sent to them as part of the course material more highly than any other electronic medium, especially when the CDs contained interactive material. On-line or Internet material was ranked fifth, after CDs, audio and video cassettes, and e-mail communications, and only ahead of radio and television broadcasts. Students have also been found to spend more time with printed text than any other medium, implying that not all material has to be computerized, (though some printed text may be delivered electronically for down-loading and printing). Another useful finding is that most students liked their courses to use a range of media. This suggests that course designers should feel free to use whatever variety of media is appropriate, given the nature of the material they want to convey, the communication infrastructure available, and cost of alternatives.

***e) Cost low enough to make the program viable with financing from fees and realistic donor subsidies***. It has already been noted that the program cannot be planned with the expectation of full cost recovery, but clearly the less the subsidy required, the more likely it is that a donor will come forward. A principle offered by the Director of Distance Education at the University of British Columbia (UBC) is that a program should expect to subsidize development costs initially, but aim to cover delivery costs from the outset. A more fully developed business plan would have to examine the feasibility of recovering even delivery costs when the clientele are in middle and low income countries. However, the following may be a useful illustration, taken from a business plan for a master's program at UBC. Note that the dollars are Canadian. (The complete spreadsheet for the projections is available in the source cited.)

**Projected Costs (for 7 years) of a Master's Degree in Educational Technology**
**A joint degree between UBC and Tec de Monterrey (Mexico)**

| | Can $ |
|---|---|
| Development costs | 769,135 |
| Program planning | 44,250 |
| Course maintenance | 266,816 |
| University/college overheads | 278,672 |
| Delivery (over 6 years, max $163,943/year) | 1,133,562 |
| **Total (7 years)** | **2,492,434** |
| No. of courses | 12 |
| Total students (over 6 years) | 2,320 |
| Breakeven fee per student | 1,120 |

Source: (Bates, 2001)

The proposed medium of delivery in this case is the Internet. CD-ROMs have been found to be an expensive means of conveying course material, at least in the US, Canada and Britain, because of the programming required to create the interactive components. One way around this is to develop interactive units in a way that relies on readily available software rather than custom programming. Another would be to use as technicians less expensive computer personnel at universities in the middle and low income countries that are going to be the recipients of the courses. Finally, as already mentioned, not all the material has to be put on CD-ROMs.

***f) An institutional framework that will allow a group of universities to offer the course.*** Little work has been done under this grant on the institutional framework needed to deliver the program. As the Prospectus for this proposal pointed out, there are models of graduate distance degrees developed and offered by groups of universities in the US. One is the Tri-State Agriculture Distance Delivery Alliance (TADDA) of Washington State University, Oregon State University, Eastern Oregon University and the University of Idaho, which grants a master's degree in agriculture. However, this consortium aims primarily at serving students within the three states, thereby bypassing the need to deal with the following university rules:

- Tuition rates that are typically higher for students from out-of-state, even in distance learning courses.
- The need to determine which institution would grant the degrees. (For any given student,

it would be the university in which he or she is resident.)

- Requirements for doctoral students that they be residential or on-campus students for a minimum period, often two semesters.

The proposed NAAEA program will have to confront each of these issues and more. Ideally, a group of interested universities will agree to make exceptions to accommodate the program, but some, if not most, may be reluctant because people in middle and low income countries are not within the official purview of land grant institutions.

However, it is clear that some universities are forward looking in the area of distance learning. An example is Kansas State University (KSU), which has a successful distance learning program leading to, among other degrees, a master's in agribusiness. It may not be a coincidence that the university's web site, under Degree Requirements, Doctor of Philosophy, states that as of fall 2001, the Graduate School no longer has a residency requirement, though each graduate program maintains the option to require one.

Kansas State University has not been approached on this matter, but if other universities are reluctant, it may be possible at the outset of program implementation to offer courses and grant degrees through that university and any others with similarly flexible rules. Hopefully other institutions will follow suit.

**Next steps**

Indications of potential demand for the proposed program are sufficiently promising, and delivery issues sufficiently tractable, that the proposal is worth carrying forward. The following are necessary steps.

1. Identify a leader who will take responsibility for taking the feasibility study further and, hopefully, implementing the program. This is likely to be at least a half time job. A number of persons have been approached, including some who are retired and therefore might have more time. Much interest in and support for the program has been conveyed, but no one has accepted so far. The search is continuing. The remaining steps would be for that person to undertake.
2. Initiate discussions with faculty who might develop and deliver courses to determine the availability of sufficient course providers and what their requirements would be for remuneration and for protection of intellectual property rights. Also discuss instructional design with these faculty members and with specialists in the subject to determine the best formats for presenting the courses.
3. Initiate discussions with universities to determine their interest in participating in the program, the extent to which existing rules would inhibit implementing the program, and their willingness to modify those rules.
4. Maintain and improve contacts with universities in middle and low income countries to keep them abreast of the development of the proposal and determine their interest in participating.
5. Draw up a business plan. Possibly also implement a pilot program to provide one or two of the most popular courses early, the purpose being both to test the market and to learn about and deal with challenges arising in implementation.
6. Raise funds to implement the program. Grant/donor support will be required for the leader's salary, course development costs, and a significant portion of student tuition.

**References**

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**Results of Survey Regarding Demand in Middle and Low Income Countries for a Graduate Level Program in Agricultural Economics**

**Sample:** Members of the American Agricultural Economics Association and International Association of Agricultural Economists with addresses in middle and low income countries as defined by the World Bank in 2001.

**Approach:** Ask respondents for their judgments regarding likely demand.

**Methods of contact:** E-mail, with the questionnaire as an attachment. Follow up letter by fax. Completed questionnaire could be returned by e-mail or fax, or from a web-site where it could also be filled out. Respondents were coded to pre-empt duplicate returns.

**Sample size:** 432 less 99 contact failures (due mainly to bad addresses)

**No. of respondents:** 130 (39% of usable addresses)

Tables are numbered according to the question numbers in the questionnaire from which the data come. Percentages include "Don't knows"(not shown), and ignore missing answers.

The number of answers is noted when those missing exceed 10% of all respondents.

Responses are shown separately for university and non-university respondents only when differences between them are notable.

**1 & 2. Level of interest likely to be shown in the proposed program by academic staff and students** (% respondents in each column)

| | Academic staff (1) | Students (1) | |
|---|---|---|---|
| | | University (2) | Non-univ (2) |
| No interest at all | 3 | -- | -- |
| Slight interest | 11 | 16 | 9 |
| Some interest | 40 | 46 | 26 |
| A great deal of interest | 41 | 33 | 51 |

(1) refers to potential users of the program
(2) refers to respondents

**3. Likely use of the program** (% respondents)

| | Advanced degree | Master's degree | Ph.D. | Individual courses |
|---|---|---|---|---|
| Academic staff | | | | |
| Probably | 42 | | | 46 |
| Definitely | 23 | | | 32 |
| Students | | | | |
| Probably | | 47 | 36 | 43 |
| Definitely | | 33 | 27 | 35 |

**4. Preferred degree source** (% respondents in each column)

| | Local university | | US or Canadian university | |
|---|---|---|---|---|
| | Univ. | Non U. | Univ. | Non U. |
| Probably support | 37 | 39 | 35 | 22 |
| Definitely support | 37 | 28 | 49 | 65 |

**5. Estimated enrollment numbers by type of course** (expected student enrollment in respondent's country)*

| | Master's degree | | | PhD | | |
|---|---|---|---|---|---|---|
| | Mean | Median | Mode | Mean | Median | Mode |
| a) Microeconomics | 15 | 10 | 3 | 7 | 4 | 2 |
| b) General equilibrium, welfare economics, | 11 | 10 | 10 | 5 | 3 | 1 |
| c) Macroeconomics | 15 | 10 | 15 | 7 | 5 | 5 |
| d) Economic dynamics, investment, growth | 13 | 10 | 20 | 6 | 4 | 5 |
| e) Statistics for economists | 15 | 10 | 10 | 7 | 5 | 10 |
| f) Econometrics I: Single equation models | 15 | 10 | 10 | 7 | 5 | 5 |
| g) Econometrics II: Systems of equations, etc | 12 | 10 | 10 | 6 | 5 | 5 |
| h) Operations Research I: Linear, nonlin. prog. | 13 | 10 | 10 | 7 | 3 | 2 |
| i) Operations Research II: Dynamic, integer | 13 | 10 | 10 | 7 | 5 | 2 |
| j) Regional and national modeling | 10 | 5 | 20 | 5 | 3 | 2 |
| k) Agricultural production economics | 13 | 10 | 20 | 7 | 4 | 2 |
| l) Agricultural marketing and price analysis | 13 | 8 | 2 | 7 | 4 | 5 |
| m) Agribusiness management and marketing | 13 | 10 | 10 | 6 | 3 | 2 |
| n) Resource and environmental economics | 11 | 10 | 10 | 5 | 3 | 2 |
| o) Food and agricultural policy | 13 | 10 | 10 | 6 | 2 | 2 |
| p) International trade | 12 | 6 | 10 | 6 | 3 | 2 |
| q) Development economics | 14 | 10 | 5 | 8 | 5 | 5 |
| r) Industrial organization | 11 | 5 | 5 | 5 | 3 | 1 |
| s) Regional and community economics | 11 | 5 | 1 | 4 | 3 | 1 |
| t) Risk analysis | 11 | 5 | 1 | 5 | 2 | 1 |
| u) Benefit-cost analysis | 13 | 7 | 10 | 6 | 4 | 5 |

* The number of answers for each course varies from 24 to 58

**7. Preferred role of local academic staff** (% respondents *supporting* this role)

| | University | Non univ. |
|---|---|---|
| Teaching | 7 | 15 |
| Leading tutorial sessions | 7 | 8 |
| Grading | 26 | 36 |
| Setting examination questions | 23 | 33 |
| Supervising research | 11 | 10 |
| No role at all* | 76 | 70 |

* From 89 answers

**10. Access to the Internet by institution** (% respondents in each column)

| | University | Non univ. |
|---|---|---|
| Inadequate and expensive | 16 | 14 |
| Inadequate but affordable | 16 | 15 |
| Adequate but expensive | 21 | 29 |
| Adequate and affordable | 45 | 40 |

**10. Access to the Internet by continent** (% respondents in each column)

| | C. Amer | S. Amer | Eur-ope | Mid East | Asia | Africa |
|---|---|---|---|---|---|---|
| Inadequate and expensive | -- | -- | 14 | 25 | 9 | 41 |
| Inadequate but affordable | 7 | 10 | 29 | 12.5 | 11 | 22 |
| Adequate but expensive | 29 | 20 | 29 | 12.5 | 31 | 22 |
| Adequate and affordable | 64 | 70 | 29 | 50 | 46 | 15 |

**11. Timing of expected improvements in Internet access** (% respondents*)

| | University | Non univ. |
|---|---|---|
| Internet capable now | 41 | 11 |
| Next 1 to 2 years | 18 | 11 |
| Next 3 to 5 years | 29 | 22 |
| Next 6 to 10 years | 3 | 38 |
| Not in the foreseeable future | 3 | 8 |

* calculated from 71 answers

**12. Preferred delivery medium** (% respondents in each column)

| | University | Non univ. |
|---|---|---|
| CD-ROM | 35 | 51 |
| Internet | 61 | 43 |

**13. Expected fall in students going to the US or Canada** (% respondents)

| | |
|---|---|
| Minimal (≤ 5%) | 49 |
| Slightly reduce (6-10%) | 13 |
| Somewhat reduce (11-20%) | 13 |
| Greatly reduce(≥ 21%) | 5 |

**14. Ability to pay fees** (% respondents in each *row*)

| Fee per 3 credit class | Definitely not able | Probably not able | Probably able | Definitely able |
|---|---|---|---|---|
| $250 | 6 | 13 | 46 | 31 |
| $500 | 20 | 35 | 29 | 11 |
| $1,000 | 52 | 21 | 15 | 3 |

**17. Respondents' institutions by type** (% respondents in column)

| | |
|---|---|
| University | 49 |
| Government | 5 |
| Research institute | 21 |
| Non-government organization | 4 |
| Private agribusiness | 4 |
| Other | 11 |

**18. Respondents' institutions by nationality** (% respondents in column)

| | |
|---|---|
| Local or national | 67 |
| International or multinational | 33 |

**19. Respondents' positions** (% respondents in each column)

| | University | Non univ. |
|---|---|---|
| Student | -- | 2 |
| Staff | 51 | 35 |
| Head of department | 31 | 17 |
| Senior administrator | 7 | 24 |
| Other | 11 | 22 |

**Residents' locations, by continent**

| | Number | Percent |
|---|---|---|
| Central America | 14 | 11 |
| South America | 20 | 16 |
| Europe | 21 | 17 |
| Middle East | 9 | 6 |
| Asia | 35 | 28 |
| Africa | 26 | 22 |
| **Total*** | **125** | **100** |

* 5 missing