DISTANCE IS DEAD, LONG LIVE DISTANCE:  
SOME THOUGHTS ON THE GLOBAL MARKET FOR  
DISTANCE LEARNING IN CONSTRUCTION MANAGEMENT AND  
ENGINEERING

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ABSTRACT

Among the gross inequities of today’s world few have effects as pervasive and long-lasting as the unequal distribution of university facilities across the globe. Distance learning is the obvious solution, which will benefit a wide range of those who are not willing or able to undertake full-time or even part-time study for a higher degree. This is essential in construction management, engineering, and allied fields, which are in ever greater demand far from the centers of the developed world. The survey presented in this paper indicates that there is a growing mismatch between the demand for and supply of higher education in terms of location, and especially in terms of developing and developed countries. Distance learning is therefore perceived as a potential solution to this mismatch. In addition, distance learning is expected to significantly reduce the cost of higher education and thus make it accessible to a larger number of people. The survey shows that the competition in higher education is expected to increase with the advent of distance learning, as well as that the number of cooperative ventures between universities and other institutions from developed and developing countries is expected to grow. Although the electronic means of delivery of distance-learning materials is expected to become ever more important, postal delivery is expected to continue playing an important role.
role. The survey indicates that distance learning can achieve the highest standards of academic excellence, as witnessed by the Open University in the United Kingdom. The main language of instruction in distance learning is expected to be English. Concerning CM&E as an academic field, the survey indicates that distance learning is still in its infancy, but that there is a growing interest in its further development. The opinions of respondents, including experts, indicate a wide range of expectations which require further study.

Keywords: Higher education, distance learning, global market, international competition, international cooperation, competitive strategy

INTRODUCTION

As soon as I agreed to take part in the Second Etkin Seminar on education in construction management and engineering (CM&E), organized by Professor Abraham Warszawski at the Technion, I realized I had practically nothing to rely upon. To put it bluntly, I realized I had little or nothing to say. I have never written about education as such, and I have read very little on the subject. Worse, my interest in education is relatively recent—since I was appointed head of my department in October 1996. For better or worse, up to that point I saw myself primarily as a researcher in construction economics and several related fields rather than as a teacher.

Nevertheless, one educational issue has exercised me since the early Nineties: distance learning. Since 1993 I have been urging my colleagues in Reading to collectively explore this opportunity for expansion on several fronts. The rapid growth and development of the Internet has contributed greatly to my enthusiasm, as the electronic delivery of teaching materials can be easily expanded to include the dissemination of our research results. All this can be seen in the context of electronic publishing. In short, electronic commerce in all its forms has been beckoning (see, e.g., *The Economist*, 1996 &1997a). At any rate, it did not take me long to decide on the subject for my contribution to the Etkin Seminar.

But I finally relaxed in connection with my paper only when I realized that I could base it on an opinion survey, which could be run over the Internet. This would give empirical substance to my contribution. Even better, my paper could serve as a starting point in this field—research into distance learning in CM&E. Besides, I realized that this survey would link well with my annual surveys of international construction (see, e.g., Bon 1997), which was inaugurated in 1992 under the auspices of the European
Construction Economics Research Unit at the University of Reading. Concerning higher education in general and distance learning in particular, I again relied on *The Economist* ‘s (1997b) excellent overview.

In the pages that follow the international survey on distance learning in CM&E is first introduced. The key findings are discussed next. The paper is then concluded with a few ideas for future research. The appendices include detailed information about the survey itself.

**THE SURVEY**

The core of my letter to respondents (Appendix A) was the first draft of my abstract for the Second Etkin Seminar, written in November 1997. I knew I might unduly influence the respondents with my own opinions, but at the same time I felt it would be useful for them to see my own “biases.” My questions (Appendix B) were again based on the draft abstract, but the key points were further differentiated and sharpened to draw as wide a range of responses as possible.

The survey was distributed via the Cooperative Network for Building Research (CNBR) in January 1998. The same month it was also distributed via electronic mail to all the heads of departments at the University of Reading, with whom I often communicate in this manner, and to the participants of the Second Etkin Seminar. Several other individuals with special knowledge about distance learning were asked to respond to the survey, as well.

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
<th>Percent*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>11</td>
<td>16.5</td>
</tr>
<tr>
<td>Brazil</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Canada</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Chile</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Denmark</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Hong Kong (China)</td>
<td>6</td>
<td>9.0</td>
</tr>
<tr>
<td>Ireland</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Israel</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>New Zealand</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Slovenia</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>South Africa</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Sweden</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Thailand</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>25</td>
<td>37.5</td>
</tr>
</tbody>
</table>
Among the 67 respondents, 8, or 12 percent, can be considered experts in the field. They currently lead distance-learning programs, schools, or universities. As distance learning has only recently begun to attract general attention, the opinions of these experts are important to compare with those of others.

KEY FINDINGS

The results are summarized in Table 2 and Figure 1. In addition to the averages and standard deviations for all respondents and experts, Table 2 contains information about the number of comments per question, to which we will return in a moment. In all columns of Table 2 maxima and minima are shown to indicate questions with highest and lowest averages and/or standard deviations. Figures 2-22 show the frequency distributions of responses to Questions 1-21.

Some respondents have provided written comments on specific questions and/or their answers, as well as their comments regarding the survey questionnaire as a whole. There are 49 comments pertaining to specific questions and 11 general comments. The distribution of comments by question is shown in Table 2. The comments themselves are compiled in Appendix C.

The 21 survey questions can be classified into eight broad themes shown in Table 3. Some questions concern more than one theme; in particular, Questions 4, 8, 13, and 16 link two themes. The mismatch between the global demand for higher education and its supply is at the focus of the survey, followed by the costs of delivery of higher education. Global competition and cooperation in higher education come next. It is clear from Table 3 that this survey is of general interest as it includes only three questions specifically concerned with CM&E. The remaining questions concern somewhat more technical issues regarding distance learning. Each theme is discussed in turn in the text that follows.

Table 2. Overview of Responses

<table>
<thead>
<tr>
<th>Question Number of</th>
<th>Overall Mean (n = 67)</th>
<th>Overall Standard Deviation</th>
<th>Expert Mean (n = 8)</th>
<th>Expert Standard Deviation</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>9</td>
<td>13.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>100.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The sum is not equal to 100 due to rounding.
Demand & Supply

The experts agree that most prominent universities are located increasingly far from the people requiring higher education, but other respondents are not sure about this proposition (Question 1). However, both the experts and others are in weak agreement with the notion that distance-learning technology has rendered distance irrelevant, so that the places of supply of and demand for higher education can be widely distributed around the globe (Question 2). This also applies to the proposition that CM&E is well suited for distance learning because the universities that excel in it are far from the countries with growing construction markets (Question 4). Weekend agreement is also in evidence with regard to the proposition that distance learning is the only viable option for higher education in developing countries because the pace of development of good universities is far slower than the growth of demand for higher education (Question 9). The experts
again agree more strongly than others with the notion that growing costs of higher education in the advanced industrial countries will make it ever less appealing for students from developing countries to seek degrees in the developed world (Question 8). There is considerable caution on the part of both experts and others with respect to the proposition that the demand for higher education in CM&E is growing faster in developing than in developed countries (Question 13). In this case, 50 percent of both experts and others are not sure about this point. All in all, a growing mismatch between the demand for and supply of higher education, including education in CM&E, is acknowledged by the respondents.

Table 3. Main Survey Themes

<table>
<thead>
<tr>
<th>Theme</th>
<th>Relevant Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand &amp; Supply</td>
<td>1, 2, 4, 8, 9, 13</td>
</tr>
<tr>
<td>Costs</td>
<td>6, 8, 12, 14, 21</td>
</tr>
<tr>
<td>Competition</td>
<td>3, 5, 7, 16</td>
</tr>
<tr>
<td>Cooperation</td>
<td>10, 16, 17</td>
</tr>
<tr>
<td>CM&amp;E</td>
<td>4, 13, 20</td>
</tr>
<tr>
<td>Postal v. Electronic Delivery</td>
<td>15, 19</td>
</tr>
<tr>
<td>Quality</td>
<td>11</td>
</tr>
<tr>
<td>Language of Instruction</td>
<td>18</td>
</tr>
</tbody>
</table>

Note: Some questions concern more than one theme

Costs

There is a strong agreement, especially among the experts, with the notion that the growing costs of higher education in the advanced industrial countries will make it ever less appealing for students from less developed countries to seek higher education in the developed world (Question 8). The difference in opinion between the experts and others is noteworthy in this case. This is also the case with the proposition that distance learning will significantly reduce the cost of higher education and that an increasing number of people will thus be able to afford it (Question 12). Here, 50 percent of the experts strongly agree with this point. The opinion is mixed on the proposition that the development costs of electronic delivery of distance-learning materials are so high that only the most prominent and well-endowed universities will be able to afford it (Question 14). The variation around the averages for both experts and others is very high in this
case, indicating diverging opinions, but it is important to emphasize that experts agree with this point whereas others disagree. Most respondents agree that the costs of distance-learning technology, and especially of electronic delivery, will decline over time, but the experts agree with this proposition much less enthusiastically than others (Question 21). As is clear from some of the comments, the key cost of electronic delivery will remain the cost of personnel, not equipment and/or communications. Most respondents firmly reject the proposition that the benchmark for all universities will be the most cost-effective distance learning (Question 6). This is the question with the lowest averages in the entire questionnaire. It is worth noting that this statement comes from the letter of the Open University’s Vice-Chancellor, Sir John Daniel, to the editor of The Economist (1997c).

Competition

Growing competition in the global market for higher education resulting from the advent of distance learning is expected by all (Question 3). Some three-quarters of the experts strongly agree with this proposition. This is the question with the highest averages and lowest variations around these averages in the entire questionnaire. However, the existing pecking order of universities around the globe is not expected to change very much as a result of this growing competition (Questions 5 and 16). It is interesting to note that 50 percent of the experts are not sure on this point. However, most respondents are in agreement with the proposition that distance learning will attract competitors from private and public institutions not presently engaged in higher education (Question 7). In sum, growing competition in higher education is expected by the respondents, and especially by the experts.

Cooperation

Most respondents strongly agree that the best universities will cooperate with those in countries with expending student populations so as to ensure direct contact between teachers and students (Question 10). Direct contact is considered central to good education, as witnessed by the comments. There is much less enthusiasm for the proposition that these joint ventures will quickly lead to the emergence of new centers of excellence around the globe (Question 16). Although 40 percent of the experts agree with this point, the remainder are either not sure or disagree with it. There is more agreement on the notion that cooperative ventures will span universities and other institutions capable of providing higher education, but not currently engaged in it (Question 17). Experts are a bit less sanguine about this point than others, however. The respondents certainly see considerable scope for cooperation in distance learning, but new centers of excellence in this field are not expected to arise very quickly.

Postal v. Electronic Delivery
Most respondents agree that electronic delivery will become the mainstay of distance learning, although postal delivery will remain essential, but experts are less enthusiastic about electronic delivery than others (Question 15). It is therefore not surprising that experts believe more than others that institutions with considerable experience in postal delivery will have a significant lead in the development of electronic delivery, as well (Question 19). Postal delivery therefore appears to be more important to the future of distance learning than the enthusiast for electronic delivery may believe. It may be concluded that the key to success in distance learning will be an appropriate mix of delivery modes.

Construction Management & Engineering

The respondents do agree with the notion that CM&E field is well suited for distance learning because the universities that excel in it are far from countries with growing construction markets, but the agreement is not very enthusiastic (Question 4). The same holds for the proposition that the demand for education in CM&E is growing faster in developing than in developed countries (Question 13). In this case some 50 percent of respondents are not sure about this question. The notion that the teaching methods, materials, and tools currently used in CM&E are well suited for distance learning does not fare better (Question 20). In this case almost 40 percent of experts are not sure about this issue, but it is important to note that experts agree on this point much more than others, whose responses are spread across the entire spectrum. All in all, it is clear from the responses that distance learning in CM&E is still in its infancy.

Quality

There is a strong agreement among respondents that distance learning can achieve the highest standards of academic excellence (Question 11). Although there are several important comments concerning the Open University, it is widely recognized as an institution of quality. The experts are even more enthusiastic on this score than other respondents.

Language of Instruction

All respondents are in agreement with the proposition that English will be the main language of distance learning, and that this will give an advantage to the universities where English is the language of instruction (Question 18). Close to 60 percent of all respondents and 50 percent of the experts strongly agree with this proposition. This result
is especially interesting given that a significant proportion of respondents are from non-
English-speaking countries (9 out of 67, that is, 13.5 percent).

CONCLUSIONS

The survey indicates that there is a growing mismatch between the demand for and supply
of higher education in terms of location, and especially in terms of developing and
developed countries. Distance learning is therefore perceived as a potential solution to
this mismatch. In addition, distance learning is expected to significantly reduce the cost
of higher education and thus make it accessible to a larger number of people. The survey
shows that the competition in higher education is expected to increase with the advent of
distance learning, as well as that the number of cooperative ventures between universities
and other institutions from developed and developing countries is expected to grow.
Although the electronic means of delivery of distance-learning materials is expected to
become ever more important, postal delivery is expected to continue playing an important
role. The survey indicates that distance learning can achieve the highest standards of
academic excellence, as witnessed by the Open University in the United Kingdom. The
main language of instruction in distance learning is expected to be English.

Concerning CM&E as an academic field, the survey indicates that distance
learning is still in its infancy, but that there is a growing interest in its further
development. The opinions of respondents, including experts, indicate a wide range of
expectations which require further study. One plausible reason for the great variety of
opinions concerning distance learning in CM&E is the recent crisis in East and Southeast
Asia, the two regions which have played an increasingly important role in higher
education in this field. The collapse of construction markets in these two regions brings
considerable uncertainty to higher education in CM&E, as well. It is reasonable to
hypothesize that the growing interest in distance learning stems from the need to diversify
the supply of education services by region and thus reduce the risk of exposure to similar
shocks in the future.

The connection between distance learning and Computer-Aided Learning (CAL)
in general was beyond the scope of this paper, but it certainly deserves greater attention in
the future. By and large, CAL and distance learning are complementary activities, and
the universities that have made significant advances in the former can be expected to
make quick strides in the latter.

The survey presented in this paper will hopefully stimulate further research into
distance learning in the CM&E field. One of the first steps in this direction will need to
be a fact-finding survey of current distance-learning initiatives in the field across the
globe. Better understanding of the current suppliers of distance-learning programs and
their markets will lead to a better understanding of the future potentials of distance
learning and its interaction with conventional modes of education. The global market for
higher education is vast and cooperation in its research area is thus well advised.

ACKNOWLEDGEMENTS
I am grateful to all those who have responded to my opinion survey: members of CNBR, my colleagues heads of departments from Reading University, and the participants of the Etkin Seminar. I am especially grateful to Sir John Daniel, Vice-Chancellor of the Open University, and Peter Goodacre, Principal of the College of Estate Management, for their participation in this survey.
REFERENCES


Dear Respondent:

I would very much appreciate your responses to my questions regarding distance learning in construction management and engineering. This will take you at most twenty minutes. The results of my opinion survey will be presented in May 1998 at the Etkin Seminar on Education in Construction Management and Engineering at the Technion in Haifa, Israel. I will circulate a summary of survey results on CNBR, as well.

I hope you will agree that distance learning is one of the key issues for our field in the coming decade. Among the gross inequities of today’s world, few have effects as pervasive and long-lasting as the unequal distribution of university facilities across the globe. In my opinion, distance learning is the obvious solution, which will benefit a wide range of those who are not willing or able to undertake full-time or even part-time study for a higher degree. This is essential in construction management, engineering, and allied fields, which are in growing demand far from the centers of the developed world. However, distance learning combined with electronic delivery via the Internet—arguably its most advanced and powerful form—requires substantial capital outlays and upkeep expenditures. I believe the competition in the global market in higher education will only intensify with the new modes of delivery, but it may also engender different forms of cooperative behavior between universities in different parts of the world, which are already intertwined through the Internet. This will be especially pronounced in construction management and engineering, where the demand for graduates often does not match the supply of qualified teachers.

The aim of this survey is to explore some key features of this emerging global market and some plausible strategies the key players will attempt in the competition for their share of the market. I have in mind a period of about five years, reaching into the first years of the 21st century.

Sincerely,

Professor Ranko Bon, Ph.D.
Head, Department of Construction Management & Engineering
University of Reading
United Kingdom
APPENDIX B: SURVEY QUESTIONNAIRE

All questions are formulated as assertions to which you should respond with “1” if you strongly disagree, “2” if you disagree, “3” if you are not sure, “4” if you agree, and “5” if you strongly agree. Please place one of these responses after each question.

1. Most prominent universities in the world are located increasingly far from the people requiring higher education—potential undergraduates and postgraduates interested in full-time or part-time education.

2. Distance-learning technology has rendered distance irrelevant, so that the places of supply of and demand for higher education can be widely distributed around the globe.

3. Competition in the global higher-education market will intensify with the development of distance learning and especially with its electronic delivery.

4. Construction management and engineering field is well suited for distance learning because the universities that excel in it are far from the countries with growing construction markets.

5. Distance learning will significantly affect the existing pecking order of universities across the globe - new centers of excellence will appear, and old ones will lose their predominance.

6. The benchmark for all universities in the future will be the most cost-effective distance learning.

7. Development of distance-learning technology will make it possible for other private and public institutions to compete with universities for the growing market in educational services.

8. Growing costs and dwindling financial support for higher education in the advanced industrial countries will make it ever less appealing for students from developing countries to seek higher-education degrees in the developed world.
9. Distance learning is the only viable option for higher education in less developed countries, as the pace of development of good universities is far slower than the growth of demand for higher education.

10. As direct contact between teachers and students will remain one of the key aspects of higher education, the best universities in the world will seek joint ventures with universities in countries with expanding student populations.

11. As witnessed by the Open University in the United Kingdom among others, distance learning can achieve the highest standards of academic excellence.

12. Distance learning will significantly lower the cost of higher education borne by students, and an increasing number of people will thus be able to afford it.

13. Demand for education in construction management and engineering is growing faster in developing than in developed countries.

14. Development costs of electronic delivery of distance learning materials is so high that only the most prominent and well-endowed universities around the world will be able to afford it.

15. Although postal delivery of distance-learning material, including CD-ROMs, will remain essential for those parts of the world where the Internet is not widely available, electronic delivery will become the mainstay of distance learning.

16. Through joint ventures with the most prominent universities in the world, some universities from developing countries will quickly become centers of excellence on global scale.

17. Development of distance learning will lead to joint ventures between teachers operating from many different locations and working for a wide variety of private and public institutions, including universities.

18. Although several other languages will be used for distance learning on global scale, English will dominate this medium by a wide margin, giving an advantage to all universities where English is the language of instruction.

19. Institutions with considerable experience in postal delivery of distance learning materials will not have a significant lead in the development of electronic means of delivery.

20. Teaching methods, materials, and tools currently used in the field of construction management and engineering are well suited for distance learning, including electronic delivery.
21. Costs of distance-learning technology, and especially of electronic delivery, will decline considerably over time.
APPENDIX C: COMMENTS ON SURVEY QUESTIONS 
AND THE SURVEY AS A WHOLE

Note: The answer and respondent’s country are listed in parentheses following each comment.

Question 1

1. Even if they live close by, many of those actively involved in construction cannot afford the time to regularly go to traditional classes. That is the main advantage of distance education: flexi time, flexi work-load. (4, Hong Kong)

2. This question is particularly difficult as it involves a lot of value judgements about who needs higher education “more.” (3, Hong Kong)

3. Most universities are in city centers. There are more city centers developing as satellites, thus making the people further away from the original universities. (3, New Zealand)

4. For undergraduates, 2; for postgraduates, 4. (UK)

Question 2

1. I am not clear about distance-learning technology, though. (4, Denmark)

2. This question suffers from hidden complexities regarding the question of quality, that is, of what is actually being delivered. (5, Hong Kong)

3. Theoretically, yes. (4, New Zealand)

4. In terms of technological capability, yes. (5, UK)

5. There is still an important role for face-to-face contact, but as part of the overall structure, such as in Open University summer schools. (3, UK)

Question 3
1. We are seeing lots of competition from the private sector. (4, US)

**Question 4**

1. Not really sure whether “suited” but I feel possible and have seen it in reality. (4, Hong Kong)

2. A lot of construction management skills, principles, procedures, cultures and country-specific. (2, UK)

3. Some issues are region- or country-specific. (4, UK)

**Question 5**

1. Depends on how much investment is made and how soon. (3, UK)

2. The opposite may be true. Why get a degree from East Liverpool when you can get one from Harvard? (2, US)

**Question 6**

1. Standards of education in whatever form should be the benchmark. (2, RSA)

2. There will still be high-prestige universities where substantial attendance is necessary. Distance learning will be the economy end of the market. (3, UK)

3. In the longer term. (3, UK)

4. I would strongly agree with “a benchmark.” (3, US)

**Question 7**

1. Correspondence course have been around for a long time and have not met with the standards of most universities. (2, RSA)

**Question 8**

1. Especially Asia at this point in time. This year we seem to have significantly increased our number of Asian fee-paying students. They may be finding us a closer and cheaper alternative to Europe or America. (4, Australia)

2. Still many value the exposure to the culture and the training you get at the residential universities. (2, Hong Kong)
3. For example, the economic crisis in the Far East. (5, UK)

4. In terms of physically attending those universities. (5, UK)

**Question 9**

1. Our economy cannot keep pace with the number of graduates. (1, RSA)

2. And countries with large land-mass, such as Australia. (4, UK)

3. In the short term. (4, UK)

4. Question unnecessarily complex. (3, UK)

**Question 10**

1. Direct contact will possibly remain significant. (3, Hong Kong)

2. The best universities will not want to tie themselves up with mediocrity and would be careful about where they make joint ventures. (3, New Zealand)

**Question 11**

1. For the students whose personalities are suited for distance education. (4, Australia)

2. You stress the unarguable success of the Open University. I agree with you but the experience acquired by the graduates of the Open University is quite different than that at the traditional university or even the “new” university. So, the assumption that with distance learning we are talking about the same thing—that is, just delivering higher education to where it is needed—needs to be thought through. (5, Hong Kong)

3. Limited only to one element of learning—cannot address personal development and group skills. (4, UK)

4. The Open University is fine for mature students; others need contact, interaction, and development of transferable skills, such as team-working. The drop-out rate from the Open University courses is very high. (4, UK)

5. The Open University faces a huge problem: how to get face-to-face teaching from their staff to their students. It remains local to the UK, as do similar ventures in other countries. If it were true that distance learning transcended national barriers, the Open University would be a multi-national corporation by now. (2, UK)

6. I am not sure this is true. Is there any research that substantiates the claim that distance learning works better than traditional learning? (3, US)
Question 12

1. Makes part-time education a reality. (4, Hong Kong)

2. Their costs will be in a different but more controllable form. They could even be higher. (3, New Zealand)

3. However, there is a question of affordability. Many of our students are funded by the government. Would such funding extend to the purchase of computer systems, and what controls would such donors have over the students? (4, RSA)

4. Still depends on government funding policy. (4, UK)

Question 13

1. Our construction-management program is standing room only. (2, US)

Question 14

1. To keep up with the edge of technology, yes—probably those that are better structured or focused. (3, New Zealand)

2. Collaboration is the answer. Will the above be better at collaboration? I doubt it. Size is an issue. (2, UK)

Question 15

1. Eventually, yes. (4, RSA)

2. Printed material is irreplaceable. Students usually print out material supplied in electronic form. Printed material could be distributed and printed locally as PDF files. In most cases properly-bound documents in full color are worth posting as costs are low. (4, UK)

Question 17

1. Teaching—even though distance-teaching—would still be a full-time job. Maybe “yes” in the case of external personnel. (2, Hong Kong)

Question 20
1. It is vital that students in these fields have hands-on experience, site visits under supervised instruction, and workshop experience to a degree. All of this can be overcome by arrangement with local companies, though. (2, RSA)

2. We need to look again at our teaching methods, which are archaic. (5, UK)

**Question 21**

1. Most of the cost is associated with the creation of content, which does not depend on technology. (2, UK)

**General**

1. A very thought-provoking survey. (Australia)

2. Nice idea. I hope we know what we are talking about. (Australia)

3. I am responding to your survey as a person who has benefited from distance learning during my postgraduate studies in construction management in Sri Lanka. (Hong Kong)

4. In places like China, Vietnam, Cambodia, etc., people are desperate for advancement, but there is also a culture of corruption and deception that would stun a naive Western professor. We have just had our distance-learning course validated for one of these countries, and we have had to take many very time-consuming and expensive measures to ensure that we know exactly who actually writes the essays. When they are submitted electronically the possibilities for scams are very wide indeed. (Hong Kong)

5. To many questions I can give only tentative answers due to my lack of acquaintance with this medium. The responses to some questions may seem quite trivial unless they are supported by lengthy argumentation. (Israel)

6. I have had considerable difficulty responding to your questions because (1) they seek responses regarding different areas of study, such as construction management and construction engineering; (2) they do not specify the target groups, such as undergraduates and postgraduates; and (3) they seek responses to several different issues in the same question, such as in Questions 9, 14, and 19. (Sri Lanka)

7. I disagree distance learning is the best mode of delivery but agree that it is the way things are going to go whether we like it or not. I think the driver of such change is economics rather than improvement in the quality of learning. Call me a cynic but that is my opinion. (UK)

8. I have to say that many of these questions are unclear, if not ambiguous, and open to much further questioning and analysis. I have tried to answer the questions as asked, but
it was not always easy. I am not sure that the causal variable are correct in numerous instances. (UK)

9. Good job. (US)

10. Your survey is very interesting. I am currently working on a case study concerning a graduate program using distance-learning tools for a major engineering company. This program was developed over three years. I strongly agree with all your questions; however, I am a little bit less optimistic about how fast distance learning will become a major educational method. (US)

11. I find your survey most interesting and look forward to receiving a copy of the compiled responses. (US)
Fig. 1. All Respondents v. Experts on All Questions
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 2. Responses to Question 1 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 3. Responses to Question 2 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 4. Responses to Question 3 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 5. Responses to Question 4 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 6. Responses to Question 5 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 7. Responses to Question 6 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 8. Responses to Question 7 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 9. Responses to Question 8 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 10. Responses to Question 9 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 11. Responses to Question 10 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 12. Responses to Question 11 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 13. Responses to Question 12 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 14. Responses to Question 13 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 15. Responses to Question 14 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 16. Responses to Question 15 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 17. Responses to Question 16 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 18. Responses to Question 17 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 19. Responses to Question 18 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)
Fig. 20. Responses to Question 19 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)

Fig. 21. Responses to Question 20 in Percent
Fig. 22. Responses to Question 21 in Percent
(1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree)