Module 4: Costing educational technologies I: mass media

Actions for 'Module 4: Costing educational technologies I: mass media'

- Print

Starts Mar 21, 2016 12:00 AM

Module title: Costing educational technologies

This module (Module 4) and Module 5 are twin modules. They both relate to the media and technologies used to bridge the gap to the distance learner. This module focuses on the more traditional media (such as radio and television). In the next module we look at Internet based media and technologies.

But before we look at the cost-structure of specific media (discussion units 4 to 6) this module starts with more general considerations on classifying media, media equivalence and on which basis at all we could compare the cost of media (discussion units 1 to 3). Hence we propose the following discussion units:

1. **Classifying media**
   We classify media in ressource and communication media.
2. **Media equivalence**
   A discussion of *media equivalence* is important in a class on the economic aspects of DE since is relates to which extent cost-effectiveness comparisons can be reduced to cost-comparisons.
3. **Student learning hours**
   Even to compare only the costs of different media we need a common unit of measurement to facilitate comparisons. We have opted for the simple measure of cost per learning time or cost per student learing hour (cost/SLH).
4. **Print and correspondence**
   Main topics 5 - 7 deal with traditional resource media. The most important of them all and still even today the most widely used medium in DE remains the printed text. In this setup feedback to the students is mostly arranged by correspondence.
5. **Radio and audio cassettes**
   Radio is for various reasons a very powerful medium especially for audiences with weaker literate competencies. It extend access to basically anywhere in the world and is economically interesting because of the scale economies it allows. Audio cassettes are similar but allow more time flexibility and re-use.
6. **Television and video cassettes**
   The comparison between television and video cassettes raise similar isssues as

the comparison of radio and audio cassettes. Televison is a powerful medium but rather expensive.

12.5 %1 of 8 topics complete
Show data table for This chart displays the number of completed topics versus the total number of topics within module Module 4: Costing educational technologies I: mass media..

List of Topics and Sub-Modules for Module 4: Costing educational technologies I: mass media

- Module 4 - Readings

  Adobe Acrobat Document

  Actions for 'Module 4 - Readings'

- Module 4 Unit 1: Classifying media

  Discussion Topic

  The rationale for expecting distance education to be cost-effective lies in its *cost-structure*, i.e. the composition of fixed and variable costs. This cost-structure of the institution as a whole is related to the cost-structure of the media or educational technologies it uses. They differ in their composition of fixed and variable costs.

  We do not make a clear distinction between *media* and *educational technologies* here. (Traditionally, the word 'media' is more used for one-way traffic communication, such as radio or television broadcasting. The technological character of these media is largely hidden from the learner, who needs to turn a radio button only. Since computers are used, which allow two-way traffic communication, demanding more user-competence, the term educational technology became more prevalent.) In any case media (or educational technologies) are of central and increasing importance in distance education. While early analyses of distance learning emphasized the organizational aspects of DE, with the emerging digital technologies their cost-effectiveness became more central.

  In this first group of main topics we discuss some basic concepts relevant for understanding media. First, we list some media; then we discuss the *media equivalence*

hypothesis; relate media to some basic modes of learning and, finally, discuss *student learning time*, as an indicator to facilitate the comparison of media.

Types of media

The following list gives a snapshot on how a major distance teaching institution internally classified the technology it used. The document included also information about the academic and production input required to support one hour of student learning. (The information provides us with some 'real world' benchmark data. However, little can be generalized from such figures since it depends very much on the specific characteristics of the content developed in each case.)

Types of media

Acronym	Medium	Comment	Academic (hrs)	Production (hrs)
Print		Study guides in units often 48 pages	32	20
A/V	Audio-vision	Tape + print etc.	25	18
TV+	TV + print	Study guides	75	673
Tut'l	Tutorial			0
TMA	Tutor Marked Assignment		7	5
HEK	Home Experiment Kits		61	70
RSch	Residential School		62	16
CMA	Computer Marked Assignment		18	23
ICMA	Interactive Computer Marked Assignments	using generative questions with hints, feedback and scoring	30	17
CTools	Computer tools	Computer-based tools, spreadsheets, data analysis	17	46

CRes	Computer based Resources	indexed and searchable databases, e.g. articles, picture library, databases	19	42
CAL	Computer Assisted Learning	Interactive, adaptive, simulation/tutorial teaching program	73	722
MM	Multi Media	Multimedia CAL , with AV media incorporated	230	809
CMC	Computer Mediated Communication	Asynchronous computer conferencing for tutorials, discussion, and self-help groups	5	0
Agr	Audio-graphics	Voice + shared screen for tutorials and group discussion		
Video			75	350

Interactive Computer Marked Assignments (ICMA)
Computer-generated test questions or exercises that can be assessed by the program, using concealed multiple choice questions or alpha-numeric or graphic input that can be interpreted in order to give the student feedback and an appropriate score. - Editing work includes checking the wording of interactive assignments which is a quick and rather straightforward task.

Computer-based Tools (Ctools)
Commercially available packages such as spreadsheets, statistics packages, computer-aided design tools etc. - Editors are involved in the discussion about computer tools but not directly involved in their production.

Computer-based Resources (CRes)
Electronic information resources e.g. encyclopaedia, databases, library resources, image banks,etc. structured, indexed and

searchable.

Computer Assisted Learning (CAL)
Computer-based tutorials including Simulation/Modelling packages. - Editors are not generally involved in the production of this type of material except to provide the important role of critical reader/development tester.

Multimedia CAL
Similar to CAL but with more presentational characteristics of multimedia. - Multimedia products vary considerably in their content and the amount of time required for study (SLH). The complexity of the content is not necessarily related to study time, and the mix of skills required to produce multimedia products varies with their content.

Conferencing tutorial (CMC):
Simultaneous networked text-only tutorial, with tutor and students connected via data lines to exchange 'discussion' usually only capable of transmitting text, not voice or graphics.

Holmberg did classify media as 'one-way-traffic media' and 'two-way-traffic media'.

1. One-way traffic in the form of pre-produced course materials sent from the supporting organization and involving students in interaction with texts; this can be described as simulated communication
2. Two-way traffic, i.e. real communication between student and the supporting organization
   (Holmberg, 1995, p.2)

Hülsmann (2000) used the term 'resource media' as distinct from 'communication media'. Both distinctions relate to ways the media could be used in a teaching and learning process. But before we look at the linkages between pedagogy and media we need to address a more fundamental issue. Can we teach at all with media or is, putting media between the teacher and learner, always a barrier making distance education a deficient way of teaching anyway?

Question: One distinctive feature of media is to which extent they allow 'responsive interaction at a distance'. Especially the extent to which media facilitate student teacher communication, this has an effect on the const structure of the medium. Why?

References:
-- Holmberg, B. (1995). *Theory and Practice of Distance Education.* London/New York: Routledge.
-- Hülsmann, T. (2000). *The costs of open learning: a handbook* (Vol. 2). Oldenburg: bis.

- Module 4 Unit 2: Media equivalence

  Discussion Topic

  The previous discussion unit dealt with the question to which extent planners can be relaxed about media effectiveness. The formula was: Provided the medium is well-chosen and functioning effectively, it plays a minor role in affecting learning outcomes." (Moore & Kearsley, 1996, p.65).

  Even so: in order to compare the cost of media we need a common unit of measurement otherwise we would have an 'apple and orange' problem. (Both are fruits but how does one compare them?)

  The only sensible unit of measurement to compare the cost of media is *cost per hour of student learning* supported by each specific medium or cost per **student learning hour** (SLH). We will write:

  cost/SLH (medium)

  Cost/SLH (print) then means the cost to provide reading for one hour of student learning.
  Cost/SLH (TV) would refer to the cost of providing one hour of student learning in form of a TV-film.

  A corollary of the media equivalence hypothesis would suggest that no medium per se has a higher effectiveness per hour than another. To assume otherwise would undermine any cost per learning time calculation. However, cost per learning time is first of all a means of costing inputs. Its purpose is to compare the costs of supporting learning in various media. It is not a substitute for testing learning outcomes.

  Credit transfer between institutions is based on (supervised) learning time. A course of three US American credit points corresponds to 150 SLH. Since credits are intended as measures of effective learning we could regard to some extent cost per student learning hour as a cost-effectiveness proxy. (Assuming we develop two versions of a 150 SLH course, one as a low cost print version, one as high cost multi-media course and students are equally successful we would say that the print version is more cost-effective than the multi-media version.)

  Specifying course credits in terms of ‘notional’ student learning hours (SLH) is becoming increasingly common. For distance learners, who often study part time, the specified

average weekly learning time may be important for their choice of courses. Moreover, it provides a reference point for the course developers, e.g. when determining the acceptable amount of reading. If you tell students that they can successfully complete the course if they invest ten hours per week, then you need to carefully control the amount of reading, the time for completing the assignments and, possibly, the time they would have to listen to the radio or communicate in an online class.

The notion of student learning hours is sometimes used to describe the number of learning hours the course offers. This sounds a bit doubtful since learning is a learner activity and something that cannot be provided externally. However, it is possible to estimate how many hours a typical student would need in order to complete a given course. Hence, when we say a course comprises 150 SLH it means, according to the estimations of the provider, students should be able to complete the course within that time. In this sense we see 'number of learning hours' as a characteristic parameter of a given course.

In order to model the costs of media, we need to identify the characteristic **fixed costs of development of one hour of student learning with the respective medium** and the **aggregate variable costs per student characteristic for that medium**. The first parameter contributes to the fixed costs of development and is often a big number, such as for example, US$ 90 000 for developing one hour of educational television, the second parameter contributes to the variable cost per student and is often small (in case of television nearly zero). Quite often the cost per student learning hour of a medium in this context refers to the **fixed costs of development of one learning hour in the respective medium**.

The other sense, in which student learning hours are sometimes used, is more context-dependent. Tony Bates for instance used the following definition:

$$\text{cost per student contact hour} = \frac{\text{total cost of delivery}}{\text{average no. of student learning hours} \times \text{no. of students}}$$

Defining cost per student learning hours (student contact hours) this way makes it the definition very sensitive to the context of application. Hülsmann's definition on the other side focusses on the fixed costs of developing an hour of learning in a given medium and may be more suitable in cases where the context of application is still uncertain.

Both ways of using student learning hours make sense but it is important to be aware of the distinction. If you read that the cost per student learning hour for television is US$ 90 this implies that 1 000 students have viewed the program and the development costs have been spread over this number of learners. This is compatible with saying that the fixed cost of developing one hour of ETV (educational television) is US$ 90 000.

References:

-- Moore, M., & Kearsley, G. (1996). *Distance Education: A Systems View*. Belmont: Wadsworth Publishing Company.

- Module 4 Unit 3: Student Learning Hours (SLH)

  Discussion Topic

  The previous main topic dealt with the question to which extent planners can be relaxed about media effectiveness. The formula was: Provided the medium is well-chosen and functioning effectively, it plays a minor role in affecting learning outcomes." (Moore & Kearsley, 1996, p.65) .

  Even so: in order to compare the cost of media we need a *common unit of measurement* otherwise we would have an 'apple and orange' problem. (Both fruits, but how does one compare them?) The only sensible unit of measurement to compare the cost of media is cost per hour of student learning supported by each specific medium or cost per **student learning hour** (SLH). We will write:

  cost/SLH (medium)

  Cost/SLH (print)then means the cost to provide reading for one hour of student learning. **Cost/SLH (TV)** would refer to the cost of providing one hour of student learning in form of a TV-film.

  A corollary of the media equivalence hypothesis would suggest that no medium per se has a higher effectiveness per hour than another. To assume otherwise would undermine any cost per learning time calculation. However, cost per learning time is first of all a means of costing inputs. Its purpose is to compare the costs of supporting learning in various media. It is not a substitute for testing learning outcomes.

  Accreditation of learning between institutions is based on learning time. A course of three US American credit points corresponds to 150 SLH. Since credits are intended as measures of effective learning we could regard to some extent cost per student learning hour as a cost-effectiveness proxy. (Assuming we develop two versions of a 150 SLH course, one as a low cost print version, one as high cost multi-media course and students are equally successful we would say that the print version is more cost-effective than the multi-media version.)

  Specifying course credits in terms of student learning hours (SLH) is becoming increasingly common. For distance learners, who often study part time, such notional required learning time may be important for their choice of courses. Moreover, it provides a reference point for the course developers, e.g. when determining the amount of

reading to be expected. If you tell students that they can successfully complete the course if they invest ten hours per week, then you need to carefully control the amount of reading, the time for completing the assignments and, possibly, the time they would have to listen to the radio or communicate in an online class.

The notion of student learning hours is sometimes used to describe the number of learning hours the course offers. This sounds a bit doubtful since learning is a learner activity and something that can be provided externally. However, it is possible to estimate how many hours a typical student would need to complete a given course. Hence, if we say a course comprises 150 SLH it means, according to the estimations of the provider, students should be able to complete the course within that time. In this sense we see 'number of learning hours' as a characteristic parameter of a given course.

In order to model the costs of media, we need to identify the characteristic **fixed costs of development of one hour of student learning with the respective medium** and the **aggregate variable costs per student characteristic for the medium**. The first parameter contributes to the fixed costs of development and is often a big number, such as for example, US$ 90 000 for developing one hour of educational television, the second parameter contributes to the variable cost per student and is often small (in case of television nearly zero). Quite often the cost per student learning hour of a medium in this context refers to the **fixed costs of development of one learning hour in the respective medium**.

The other sense, in which student learning hours are sometimes used is more context dependent. It defines the number of student learning hours produced as the product of the number of students and the notional learning time for each student. This way of using student learning hours makes sense only within a given context (e.g. a specific course). If you know the specified number of learning hours a course offers in a specific medium as well as the number of students enrolled, you can calculate the cost per learning hour per student for the respective medium.

Both ways of using student learning hours make sense but it is important to be aware of the distinction. If you read that the cost per student learning hour for television is US$ 90 this implies that 1 000 students have viewed the program and the development costs have been spread over this number of learners. This is compatible with saying that the fixed cost of developing one hour of ETV (educational television) is US$ 90 000.

References:

Moore, M., & Kearsley, G. (1996). *Distance Education: A Systems View*. Belmont: Wadsworth Publishing Company.

Please, post questions and comments you may have with respect **to Student Learning Hours (SLH).**

The MDE courses generally carry 3 American credits. This corresponds to 150 notional student learning hours. (Does this correspond with your own experience?)
The European Credit Transfer System (ECTS) assumes that 30 notional student learning hours correspond to 1 credit (1 ECTS).
Obviously it is assumed that the student learning time is properly monitored by an accredited institution.
Do you think that such measures make sense?

- Module 4 Unit 4: Print and correspondence

Discussion Topic

The following examples deal with print, radio and audio cassettes, TV and video as well as different computer applications. As emphasized before, these figures should not be treated as reliable cost information. Though the individual figures used in the activities are 'real world figures' they may not apply in your context. (More up to date figures you can find in Cost€r; see below.)

While figures vary substantially (Table below) we can distinguish some orders of magnitude within which they vary. Taking print as the medium of reference, audio may be expected to be about ten times as expensive, radio 30 times, video 50 times and television 150 times.

Benchmark costs SLH per medium

	Unit	Academic input	Production-related input	Total fixed costs of development	Variable cost per unit	SLH equivalent to unit	Cost / SLH	Comparison	
								Low	High
Print	StG (48 pp)	US$ 2 800	US$ 700	US$ 3 500	US$ 1.8	10	US$ 350	1	
Print	StG(48 pp)	US$ 15 000	US$ 7 000	US$ 22 000	US$ 1.8	10	US$ 2 200		1
Audio	30 min	US$ 930	US$ 600	US$ 1 530	US$ 2	0.5	US$ 3 060	9	2 x 10
Audio	30 min	US$ 3 600	US$ 9 000	US$12 600	US$ 2	0.5	US$ 25 200	72	12
Radio	20 min	US$ 300	US$ 2 860	US$ 3 160	0	0.33	US$ 9 480	28	5 x 30
Radio	20 min	US$ 600	US$ 13 500	US$ 14 100	0	0.33	US$ 42 300	121	20
Video	30 min	US$ 2 700	US$ 8 000	US$ 10 700	US$ 4.5	0.5	US$ 21400	62	10 x 60
Video	30 min	US$ 2 000	US$ 40 000	US$ 42 000	US$ 4.5	0.5	US$ 84 000	240	39
TV	25 min	US$ 1 800	US$ 36 000	US$ 37 800	0	0.42	US$ 90 720	260	42x150
TV	25 min	US$ 3 000	US$ 75 000	US$ 78 000	0	0.42	US$ 187 200	535	86

The following sections review the classical media and make some of the assumptions leading to the above figures explicit. Most of the spreadsheet activities are based on these figures.

Printed material and correspondence

The most important instructional medium is the text. It played a central role in the initial phase of distance education as printed text (e.g. 'study guide') and now plays an important role in distributed e-learning as digital text. From a costing point of view the difference is one in distribution, rather than development. (There are some added costs in editing a text to make it a hypertext (e.g., the inserting and testing of **links**).) However, essentially the cost structure remains similar. While digital distribution is less costly, the development of online material is slightly more costly.

Text (as printed material or in digital format) remains the most important medium in distance education. Even in the period when multi-media instruction was *en vogue* these media were 'embedded' in an instructional framework based on text. It is therefore important to understand the costs and the cost-structure of developing printed material.

In the next activity we assume that course-specific study guides (StG) are developed with a standard length of about 50 pages (48 pages for optimal use of paper). To prepare a typical guide, we assume an input of 50 academic staff days at US$ 300 per day, or US$ 15 000 per guide. Non-variable production costs (such as editing, design and fixed print) amount to US$ 7 000 for production. Added together this amounts to US$ 22 000 per guide. (This is a high cost version where we assume that text is developed from scratch. Lower costs are possible (cf. above table).)

Our hypothetical courses will also include for assessment of 24 pages requiring 10 days of academic input. If again the academic person day is rated at US$ 300, this amounts to US$ 3 000. Layout and editing (fixed print) will cost up to US$ 2 700. Hence the cost of preparing such an assessment booklet may amount to US$ 5 700. Since it is appropriate to modify the assignments annually we assume an additional five academic days per annum for maintenance, amounting to US$ 1 500 per year.

Coming to the variable costs of presentation, we distinguish between production related activities and the activities of supporting students' learning. In the first category we will assume that the replication and mailing costs per study guide are US$ 0.75 per guide and US$ 0.5 per assignment booklet.

Students learning is supported by giving them feedback on their assignments (priced at US$ 21 per assignment) and tutorial meetings. For a group size of 25 students a benchmark may be US$ 60 per tutorial contact hour contributing about US$ 2 to the unit costs.

Activity A18: Printed study guides

For this activity you will use three spreadsheets, all placed in the same Excel workbook, Activity A18.

Spreadsheet 1 - Portfolio and cost description
The first spreadsheet reports the cost of a simple course based on printed study guides. Student learning is supported by tutor marked assignments and tutorials. Quantities and costs (the figures in red) can be varied in the spreadsheets.

Spreadsheet 2 - Annual costs
The second spreadsheet calculates annual costs. The default version in the spreadsheet calculates the annual costs on the basis of depreciation rates. A macro (Ctrl+t) calculates the respective annualization rate and substitutes it for the depreciation rate. The spreadsheet calculates the cost per year (charging the development costs equally to the years of the shelf life of the course). This helps in setting student fees. Basically, student fees need to be slightly higher than the average cost per student per annum, creating a small profit margin that insures against risk. The profit margin and the number of student per year (both figures in red) can be changed to explore the implications for total costs, average cost per student, and break even points.

Spreadsheet 3 - Total cost and average costs
The third spreadsheet shows you the results of the choices that you have made in the first two spreadsheets. It calculates the TC and AC equations, giving their respective graphs and break even points.

Things to try	
1.	*Verify that annualization increases total costs and average costs.*
2.	*Try reducing student support (e.g. no tutorials, no assignments).*
Notes	
1.	*If you want to run a macro you need to have the spreadsheet page for that macro open. Running a macro for another page is likely to cause errors. However, if this happens, close the activity without saving and start afresh.*
2.	*The spreadsheet adjusts fees to reflect costs. The fee is based on average cost per student plus a margin for profit and a*

	margin for risk. Our assumption that enrollment levels will not be affected by higher fees may not be realistic.
3.	*The V lines may not be visible on your economies of scale worksheet. This happens when the value of V is very low, making the V line contiguous with the bottom axis of the graph.*

Click here

Cost/SLH(print)

It is possible to estimate, based upon the above assumptions, a cost/SLH(print). Assuming US$22,000 per guide and assuming further that one study guide supports about 10 hours of student learning, we would have:

cost/SLH(print) = US$ 2 200.

This figure for cost/SLH(print) is at the high end of the spectrum. The elasticity of the figure is due partly to the assumptions one may make on the number of notional learning hours supported by such a study guide. If we assume that a study guide is the basis of study for 2 weeks and further assume a notional study load of 10 SLH per week then we would have:

cost/SLH(print) = US$ 1 100.

A reasonable benchmark figure would be:

cost/SLH(print) = US$ 1 500.

For the course planner the important benchmarks are a pair of two numbers:

(cost/StG, VStG) = (US$ 22 000, US$ 0.75)

where StG stands for study guide.

Figures in terms of cost/SLH per student (i.e. (cost/SLH(print))/N) are very context sensitive. If you have a hundred students you come up with a figure of (cost/SLH(print))/100) = US$ 2 200/100 = US$ 22 and if you have a thousand students in the system the figure would fall to US$ 2.2. For the purpose of giving the course developer a benchmark to compare costs of media, it makes sense to focus on the **fixed costs of development per student learning hour** as unit of comparison. In addition, the respective **variable costs per student** have to be kept in mind. (Note, however, that it makes little sense to break the variable costs down for SLH.)

Activity 18: The activities should give you a feeling for the cost structure of specific media. The message is mainly about the different potential for scale economies as you can see in the AC graphs. - Also view the following Wimba demonstration:

You have been invited to join a Wimba Classroom archive.

// Archive Info
Name: Activity 18 - 03/11/2012 13:00
URL:
http://umuc.wimba.com/launcher.cgi?room=thuelsmann1_01_2012_0311_1300_41
Room ID: thuelsmann1_01

As usual, the activities are for your self control. Yo may share observations which you find relevant and ask questions. You are very welcome to do so. But do not feel obliged to post all 'solutions' especially if they were already posted.

- Module 4 Unit 5: Radio and audio

Discussion Topic

Radio broadcasting is, in terms of cost structure, an ideal medium. Marginal costs, i.e. the costs of including another learner, are zero as far as the medium is concerned.

For the first spreadsheet activity on radio costs we have assumed costs of about US$ 14 100 per program of 20 min. This comprises production costs (US$ 13 500 per program) and academic time (two academic staff days or US$ 600). In terms of cost per learning time, we have:

cost/SLH (radio) = US$ 42 300.

Transmission costs have to be added to this. These are neither 'variable costs per student' nor fixed costs. For each cohort of students there is at least one transmission (in fact, a repeat transmission) costing US$ 675. Hence we treat transmission costs as fixed costs incurred each time the course is presented.

Activity A19:
Radio and Print

This activity allows you to explore the effect of including radio programs. As an add-on radio only increases costs.

Use the spreadsheet Activity A19 for this.	
Here are some issues to explore:	
1.	*Is it possible to reduce other costs in order to make the choice of radio as the main medium of instruction competitive?*
2.	*What happens if you reduce assignments and tutorials?*
3.	*How does the annual enrollment level affect costs?*
Notes	
1.	*If you want to run a macro you need to have the spreadsheet page for that macro open. Running a macro for another page is likely to cause errors. However, if this happens, close the activity without saving and start afresh.*
2.	*The spreadsheet adjusts fees to reflect costs. The fee is based on average cost per student plus a margin for profit and a margin for risk. Our assumption that enrollment levels will not be affected by higher fees may not be realistic.*
3.	*The V lines may not be visible on your economies of scale worksheet. This happens when the value of V is very low, making the V line contiguous with the bottom axis of the graph.*

Click here

Radio or audio cassettes

The figures for the next activity are based on Bates (1995) slightly simplified for the purpose at hand. They differ substantially from the figures used for the above activity. Bates indicates OUUK production costs for 20 min programs of US$ 2 860 per program, or US$ 8 511 per SLH. Academic input is estimated as US$ 300 per program or US$ 900 per SLH. This amounts to fixed costs of development and production of one program of US$ 3 160. In terms of cost per learning time we have: cost/SLH (radio) = US$ 948 (Bates, 1995, p.142). The figures are converted (at a rate of 1.5) into US$ without deflating them. Taking the figures out of context and simplifying them considerably would render deflating rather meaningless.)

Bates notes that costs would decrease if course production could run on full capacity since where there are large production overheads, the wider they can be spread, the lower their impact per program.

Audio cassettes and radio programs have distinctively different cost structures. Generally, the fixed costs of development for radio are higher (especially, the production costs) than those for audio cassettes, but the variable costs of distribution or/and storage for audio cassettes are higher since there are no corresponding costs for radio. The conclusion is that while for small enrollments audio may be more cost-efficient for large enrollments radio may be more appropriate.

We assume in the activity that producing a 30 min audio cassette requires 12 academic days (or US$ 3 600) while the production cost amounts to US$ 9 000. This adds up to US$ 12 600 for a 30 min audio cassette or, in terms of cost per learning time:

cost/SLH(audio) = US$ 25 200.

Activity A20:
Radio or audio cassettes?

Use the spreadsheet Activity A20 for this.	
The default version in this example is two radio programs per week and not much print.	
1.	*Try changing from radio to audio cassettes.*
2.	*What happens when you support the same number of learning hours with audio cassettes?*
3.	*Which is the more cost efficient solution?*
4.	*If you substantially increase enrollment does this change anything?*
Notes	
1.	*If you want to run a macro you need to have the spreadsheet page for that macro open. Running a macro for another page is likely to cause errors. However, if this happens, close the activity without saving and start afresh.*
2.	*The spreadsheet adjusts fees to reflect costs. The fee is based on average cost per student plus a margin for profit and a margin for risk. Our assumption that enrollment levels will not be affected by higher fees may not be realistic.*
3.	*The V lines may not be visible on your economies of scale worksheet. This happens when the value of V is very low, making the V line contiguous with the bottom axis of the graph.*

Click here

As usual, cost-structure refers to the relative composition of fixed and variable costs. For radio, there are next to no variable costs per student. Audio cassettes, on the other hand, though generally cheaper to produce, have the variable cost of replicating the cassettes, handling and mailing them.

If you want to compare media in terms of their cost per SLH you need to be aware of two factors affecting the figures:

- First, some authors cite cost per student learning time as a cost per student. The disadvantage here is that figures become too dependent on the number of students to be useful for the course planner. If you use this definition you need to compare cost per SLH per student for some standard enrollment level.
- The second factor is hidden in the assumption of listening time and learning time. Since you can stop and start a cassette, it is possible that a 30 min cassette provides more than 30 min learning time.

Figures on cost per learning time are difficult to interpret if such assumptions are not spelt out.

Note: The traditional audio cassettes are today obsolete. You would use digital media such as CDs or DVDs. Nevertheless, whenever you decide to produce physical media and send them to students you incur costs of production and distribution. Even today modern DE institutions still send students study guides (in order not to devolve heavy printing costs to students who often still prefer reading print).

Task: Discuss the cost structure of media with respect to the changing technologies and advantages for learning. (You may recall Bates' ACTIONS model.)

As usual, the activities are for your self control. Yo may share observations which you find relevant and ask questions. You are very welcome to do so. But do not feel obliged to post all 'solutions' especially if they were already posted.

- Module 4 Unit 6: TV and video

Discussion Topic

One source identifies the following costs for a 25 min TV program: Production costs US$75,000 plus US$3,000 (or 10 days) of academic input. This amounts to US$ 78 000 for a 25 min program or:

SLH(TV) = US$ 187 200 for one SLH(TV).

Added to this are US$ 300 per broadcast.

Another source is, again, Bates (1995). According to Bates, the average production cost per program of 25 min is US$ 36 000 and per SLH US$ 85 400. To this academic input is rated with US$1,800 per program. This amounts to US$ 37 800 per program or:

cost/SLH(TV) = US$ 90 500.

To this transmission costs of US$ 1 980 needs to be added.

Activity A21:
Television

Use the spreadsheet Activity A21 for this.	
Here the default option is TV.	
1.	*Try to find a less sophisticated option (say print plus audio cassettes), which allows you to increase student support (tutorials and tutor marked assignments).*
2.	*What do you observe?*
3.	*I think you will see that you can go a long way in terms of student support, if you go for low cost media.*
4.	*Now increase the enrollment substantially.*
5.	*What do you observe?*
6.	*Is there a level of enrollment where the high cost TV option is more cost efficient?*
Notes	
1.	*If you want to run a macro you need to have the spreadsheet page for that macro open. Running a macro for another page is likely to cause errors. However, if this happens, close the activity without saving and start afresh.*
2.	*The spreadsheet adjusts fees to reflect costs. The fee is based on average cost per student plus a margin for profit and a margin for risk. Our assumption that enrollment levels will not be affected by higher fees may not be realistic.*
3.	*The V lines may not be visible on your economies of scale worksheet. This happens when the value of V is very low, making the V line contiguous with the bottom axis of the graph.*

Click here

Cost-effectiveness and volume of production

The activities indicate that the costs per SLH go down when good use is made of the available capacity. This would suggest that it is more cost-efficient for an institution to produce more rather than fewer television learning hours. However, since the fixed costs of development for one hour of educational television are quite high, you would need many more learners in order to cover these costs.

One source reports the academic input for the production of a one hour video as nine days of academic time and 44 days of production related activities. This amounts to US$ 2 700 for academic time and about US$ 8 000 for production related inputs. The figure for cost per video supported student learning hour:

cost/SLH(Video) = US$ 10 700.

Another source reports much higher costs. In this case, a 30 min video costs US$ 60 000 plus ten days of academic input, i.e. US$ 3 000. This means:

cost/SLH(Video) = US$ 126 000.

Replication and mailing cost US$ 2.25 per cassette in this case.

Activity A22:
Video cassettes

Use the spreadsheet Activity A22 for this.	
This spreadsheet starts with television as the default option.	
1.	*Try using video cassettes as an alternative (with same number of student learning hours).*
2.	*What do observe?*
3.	*You can substantially increase student support even add some other media.*
4.	*You may have found out that going for video cassettes is the cheaper option. I assume you have increased student support. Now make the enrollment substantially higher. At what level does the expensive TV option become more cost efficient?*
Notes	
1.	*If you want to run a macro you need to have the spreadsheet page for that macro open. Running a macro for another page is likely to cause errors. However, if this happens, close the activity without saving and start afresh.*
2.	*The spreadsheet adjusts fees to reflect costs. The fee is based on average cost per student plus a margin for profit and a margin for risk. Our assumption that enrollment levels will not be affected by higher fees may not be realistic.*
3.	*The V lines may not be visible on your economies of scale worksheet. This happens when the value of V is very low, making the V line contiguous with the bottom axis of the graph.*

Click here

Question: Radio and TV for educational purposes declined in the recent decades. What are the reasons? Which effect this had on the institutional structure of big distance teaching institutions and the media diversity of the programs?

As usual, the activities are for your self control. Yo may share observations which you find relevant and ask questions. You are very welcome to do so. But do not feel obliged to post all 'solutions' especially if they were already posted.

- Module 4 Unit 7: Cost€r

  Discussion Topic

  In my discussion of costs I always argued that it is important to know something about *cost-structures* rather than actual cost figures. You have probably found with good reason on various occasion the figures wrong, i.e., very different from what you may have found in your context. There are excuses for that, one is that there are little published cost figures (since institutions in this respect behave like secret services: I want to know all about you but don't let you know anything about us); the second reason is that contexts vary greatly.

  The excuses for not being able to offer actual cost figures can to some extent compensated by tools such as Cost€r, a costing tool developed by some European universities (including some DE universities). The tool is free but the dataset is taken from some European countries. However, you can set the display to US$ and use the appropriate exchange rate (the datasets are from 2004 hence you can use the 2004 exchange rate to the dollar).

  Here is the website: http://www.coster.ws/en/coster_tool.htm

  

  And here a tutorial: http://www.coster.ws/video/tutorial.htm

  Before you experiment with the site let me point out some strengths and some weaknesses of the tool. The strength is that you have real world cost figures (albeit more taken from a European context, I suppose) for an incredible range of activities. But this

strength is already a weakness: It assumes a high level of division of labor. The effect of this is that in setting up a project you think you need to include all sorts of experts. This leads to a cost-creep and you end up with rather high costs. Hence my first warning: you need to be selective.

Note also that the approach is always based on time used by the several specialists. How much time is needed for an expert to write a study guide? Youmay be used to approach the issue from a different angle: What does my budget allow spending for creating a study guide. This approach is not used in the Cost€r. It is always starting from the large range of specialists and the time they may spend.

The other disadvantage is that the tool allows you at best setting up the ingredients sheet and even that without a clear classification of costs in different categories. The rest you have to do yourself. The tool itself does mnot lend itself easily to modeling the way you learned in this course. However, you can export cost data to Excel and the process the data for further modeling. The disadvantage of Cost€r is that it does not immediately lend itself to modeling of costs and graphing cost functions.

The wimba recording discusses the use of Cost€r:

You have been invited to join a Wimba Classroom archive.

// Archive Info
Name: Coster - 03/13/2012 14:16
URL:
http://umuc.wimba.com/launcher.cgi?room=thuelsmann1_01_2012_0313_1416_03
Room ID: thuelsmann1_01

As usual, the activities are for your self control. Yo may share observations which you find relevant and ask questions. You are very welcome to do so. But do not feel obliged to post all 'solutions' especially if they were already posted.