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ABSTRACT
        This paper provides an initial examination of over 614
undergraduate multimedia courses now available in the United Kingdom with
discussion centered on reasons for recent course expansion. Areas of specific
growth and issues of course design are presented in the analysis and
discussion. Changes in the application of multimedia from subject-specific to
second subject contextualization are also discussed with reasoning to support
learning benefits to be derived from this approach, and implications for
course designers and providers are concluded. (Contains 14 references, 3
tables, and 1 diagram.) (Author)

Rethinking multimedia teaching: examining developments in multimedia course provision.

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Abstract
This paper provides an initial examination of over 614 multimedia courses now available in the UK with discussion centred on reasons for recent course expansion. Areas of specific growth and issues of course design are presented in the analysis and discussion. Changes in the application of multimedia from subject-specific to second subject contextualisation are also discussed with reasoning to support learning benefits to be derived from this approach, and implications for course designers and providers are concluded.

This paper will be of interest to multimedia and online course designers, managers and tutors, instructional designers, and those involved in institutional curriculum planning.

Introduction and motivation for this work

The motivation for this study arose early in 1999. Our study centre, CSALT[1], had successfully run an MSc in Advanced Learning Technology since 1993 and we started to give serious consideration to a course for undergraduates which married learning technology with learning theory . Our objective was not only to equip a graduate with educational knowledge and awareness, but to support this with a range of information and communication technology (ICT) and multimedia production skills in order to prepare them to make better use of educational technology already available in many educational settings.

Our first step towards this objective was to review existing course availability in this field. The University and Colleges Admissions Service (UCAS) in the UK at that time offered 53 courses related to the themes of 'educational technology', 'multimedia technology' and 'learning technology'. We also noted that approximately 250 courses were then running which included the term multimedia in their title. Given that competition between Higher Education Institutions (HEIs) in the UK can be very high, the relatively low provision of courses in the educational technology area suggested a yet-to-be exploited area for development. Consequently the authoring of course rationales and modules commenced.

The first working title for the new degree was 'Multimedia and Online Learning Technologies'. This changed to 'Multimedia Learning Technologies' within a week or so as we felt the first title to be too long and we also embraced the idea that "... the term multimedia is used to encompass both online and offline projects" (England and Finney, 1999) from one of the identified course books.

In the Spring of 2001 the degree scheme cleared the last university approval committee, though several changes had taken place by this point, not least to the title. The term 'Learning Sciences' now replaced Learning Technologies in order to emphasise that theoretical aspects of learning played an equal role to those of technical production and realisation. The second title change was the removal of the word multimedia completely to leave a new title of 'Learning Sciences & Technology'. This latter change caused more than a little concern between the course authors and validators over what potential students- and tutors- may understand as the focus of the degree.

With this latter question in mind we decided to again examine the availability of multimedia and learning technology related courses offered through UCAS commencing in 2002 . To our great surprise 614 courses were available across the UK which included the term multimedia in their title. This caused pause for thought and fresh questions came to mind, not least:

- What were the causes of so much expansion in multimedia course provision so quickly (around 160% increase in 2 years)?
- Had the definition of multimedia evolved to include many more new options?
- What aspects of multimedia or skills were students learning in these courses?
- Though we had removed multimedia from the title of our own scheme, was this perhaps the most appropriate thing to do, both for marketing and pedagogic reasons?

Multimedia course analysis

In order to understand this change it was necessary to review multimedia course availabity on a year-by-year basis. Had this change happened gradually, or was it sudden and dramatic due to improvements in access to and in the performance of technologies associated with multimedia? An analysis of this data (table 1) showed a dramatic increase in multimedia course provision between 1998-99 with 179 new courses running, compared to 95 new courses running in 1997-98 and 56 in 1996-97. The data also showed a decline in the number of multimedia courses running in for 2000-2001 (105 discontinued courses and 76 suspended from the previous year) though projections had once again picked up for 2002.

Year MM courses	1996	1997	1998	1999	2000	2001	2002
Cancelled			2	31	9	7	1
Discontinued	1	23	27	46	67	105	109

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Running	121	177	272	451	560	547	617[2]
Suspended	6		3	5	9	76	2
Grand Total	128	200	304	533	645	735	729

Table 1. Statistical data showing multimedia related courses in the UK from 1996 to 2002. Data supplied by UCAS Data and Analytical services (updated January 2002).

We then examined the courses in more detail in order to identify those courses relating to our own course which originally combined multimedia with learning and technology. This inspection highlighted a number of variations on the use of the term *multimedia* itself. Ten variations were identified including 'Creative Multimedia (MM)', 'Interactive MM', 'MM Communication', 'MM Computing', 'MM Electronic Technology', 'MM Studies', 'MM systems', 'MM Technology', 'MM Visualisation' and 'MM web production[3]. Some discussion took place as to what these terms may actually mean, what the courses which used these titles focused on, and whether students would necessarily understand differences between the various titles.

The next stage of our investigation focused on the placing of the word *multimedia* or one of its curriculum variants in the course title; some courses offered multimedia or a variant alone, some offered multimedia or a variant with a specific topic (e.g. Multimedia systems and theology), and some offered a specific topic with a multimedia or variant (e.g. Chemistry and Multimedia Technology). A classification system was drawn up to structure course titles in order to identify any development patterns (table 2). The data from this examination indicated that, in the vast majority of cases, the term multimedia or variant had been coupled with another subject study area to create a combined degree (over 478 courses from 614 making 78% MM course provision coverage).

MM term position:	MM alone	Qualified MM.	MM 1st	MM 2nd	MM 3rd	unsure	Total
HE offered degree incl. FE/HE[4] & FD[5]	10	42	198	235	9	7	501
HE offered HND	14	7	3	6	0	0	30
FE offered degree incl. FD.	2	0	17	2	0	0	21
FE offered HND	45	0	9	8	0	0	62
Total:	71	49	227	251	9	7	614

Table 2. Course titles and place of 'multimedia' i.e. 'Multimedia and topic', 'Topic and multimedia', or 'Topic, topic and multimedia'. HND courses usually cover a period of pre-university study up to and sometimes including the first year of a degree level course.

MM term position:	MM	Qual MM.	MM 1st	MM 2nd	MM 3rd	unsure	Total	As %
Applied sciences			31	56	1	1	89	14.5
Arts & humanities			77	78	1	2	158	25.7
Environment & Natural sciences			17	27	0	0	44	7.2
Management			47	50	7	2	106	17.3
Social sciences			29	21	0	0	50	8.1
Cross depts			18	7	0	0	25	4.1
Law			2	5	0	0	7	1.1
Engineering			1	3	0	0	4	0.7
Sports science/Heath care			5	4	0	0	9	1.5
Undetermined	71	49	0	0	0	2	122	19.9
Total:	71	49	227	251	9	7	614	100.0

Table 3. Multimedia course analysis against Faculty provision. The Faculty structure used was that of the authors' own university. The grey areas for MM and Qualified Multimedia degrees are left blank due to the possibility of delivery by several departments in different faculties.

As a next step we made a provisional examination of these multimedia combined courses in order to identify any specific areas of growth or development. This activity proved to be very subjective and whilst coupling multimedia with some subjects seemed to make some rational sense (e.g. Multimedia Communications & Business Studies, or Multimedia and Internet Technologies) others proved to be more taxing on our immediate understanding (e.g. Geratology and Multimedia Systems). We were particularly curious about 'Complimentary therapies and aromatherapy and Multimedia systems' insofar as whether the course utilised the sense of smell alongside text, images, audio and graphics.

In order to limit subjectivity we established a Faculty classification system. Taking the Faculty and Department structure at Lancaster University as a framework, each course was placed in the Faculty which would best provide a home for its study; for example, Mathematics and Multimedia Communication was placed in Applied Sciences due to the mathematical and possible technical components of what may be meant by Multimedia Communication. This classification system resembled the hierarchical classification systems used in phenomenographic

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[2] The figure of 617 reported here shows an increase on our earlier reported figure of 614 due to 3 new courses becoming available in the period between our initial analysis and contacting the UCAS for a statistical search.
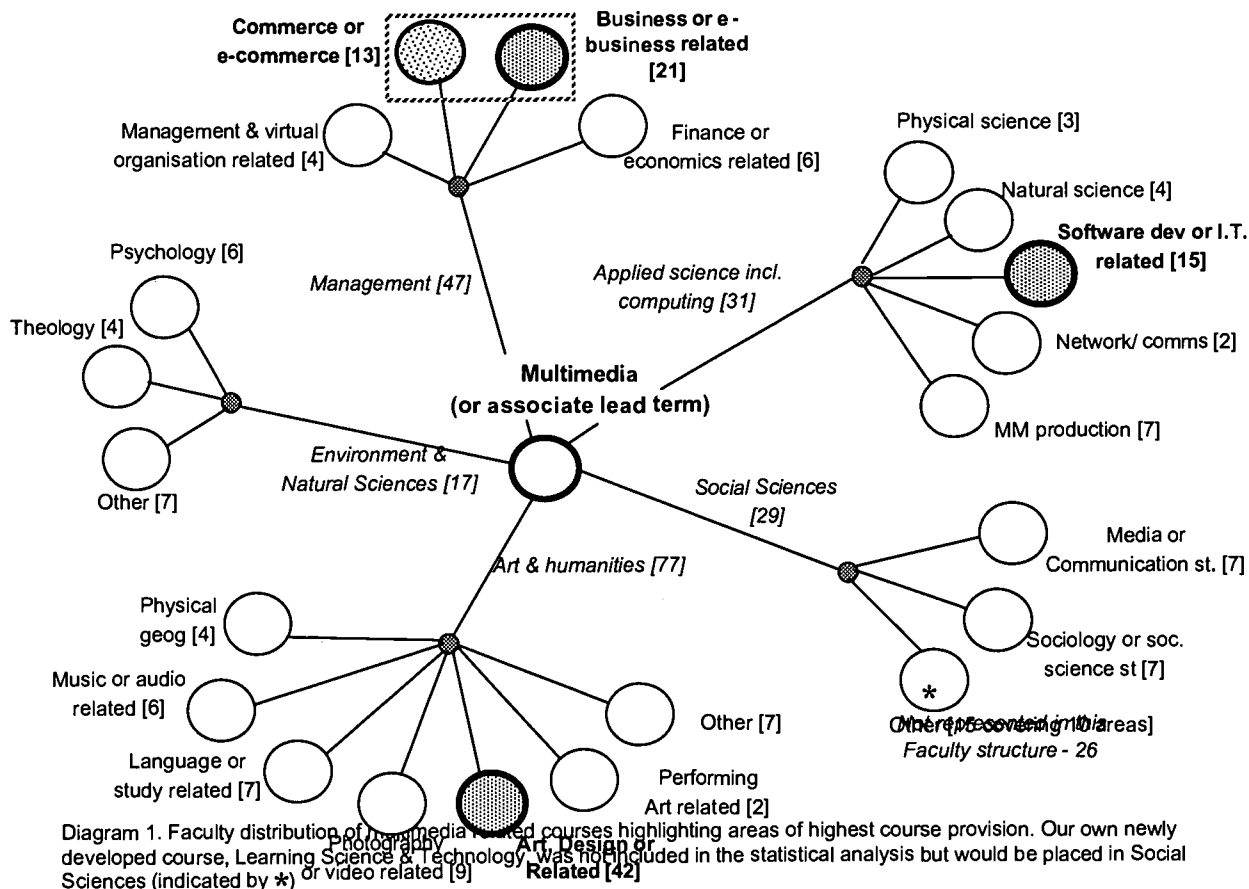[3] We refer to these as Multimedia offspring or Multimedia variants
[4] Further Education (FE or tertiary education) is usually the stage before Higher Education (HE or university) for many UK based .students.
[5] Foundation Degree (FD) is sometimes referred to as a Year 0 course and can be taken prior to University (HE) study.

analysis (Säljö, 1988; Marton and Säljö 1976a; 1976b). In support of this method we applied an independent co-judging technique[6] which provided 85.7% classification agreement, within Säljö 's 20% error tolerance. The resulting classifications were then tabulated (table 3) and spatially examined (diagram 1).

The analysis of this data highlighted three areas of interest and discussion:

- That over a quarter of all multimedia related degree schemes and modules were related to Arts and Humanities
- That ICT and Applied Sciences (including computing and networking) accounted for less than 15% of multimedia degree and module related delivery
- That expansion of multimedia courses related to Business and Management and, in particular, the emergence of e-business and e-commerce courses, were higher than expected.

Diagram 1. Faculty distribution of multimedia related courses highlighting areas of highest course provision. Our own newly developed course, Learning Science & Technology, was not included in the statistical analysis but would be placed in Social Sciences (indicated by *)

In consideration of this result we are aware of the subjectivity involved in the Faculty placing of each course, even allowing for judging and co-judging described. In order to refine these results it became necessary to examine the rationale and structure for each course provided. However, before setting out to complete such a detailed analysis for all 614 multimedia related schemes specified, we felt an examination of a sample of these courses would help us to best determine how to go about this task and what such an analysis may yield. This led us naturally into the second of our initial questions as to whether the definition of multimedia had evolved and how it may have done so.

Initial course rationale analysis
In our previous examination of course titles we took care to track Higher National Diploma (HND) courses separately from degree courses. HND courses tend to be delivered by colleges with a Further Education (FE) focus or those which may not be able to resource and staff a complete degree course. This is illustrated in the data (table 1) where 62 of 90 HNDs are offered by FE focused establishments. One further difference is that HNDs have tended to be skill or vocational orientated qualifications, compared to HE awarded degrees which may comprise levels of reflection or meta-cognitve components. To examine this situation for multimedia related qualifications we acquired details of a number of schemes for analysis.

The first HND in Multimedia in FE in the United Kingdom was produced at Halton College and validated by the Business and Technology Education Council (BTEC) in Summer 1996. The rationale for this course states:

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[6] With Dr. Michael Pengelly, CSALT, Lancaster University

"The proposed course in multimedia has been developed to provide students seeking a career in multimedia with experience, knowledge and awareness of production, management and technical aspects of the relevant environment. It is expected that students following the course will leave well prepared for further study in higher education or for working life in a commercial or business setting.... Construction of the course has been centered around multimedia production, authoring, design and management, forming the main themes of study for both years."

(O'Donoghue, 1996: 5)

The course made use of 12 key modules which covered aspects of design and production equally and was delivered by a team of tutors drawn from the cross-college multimedia department. The emphasis on "production, authoring, design and management" provides an indication that the course was skills focused. This can be compared to a degree scheme in multimedia produced at the same college the following year whose rationale had a wider developmental focus:

" ? [to] create a core of multimedia activities, projects and studies compulsory for all students
   ? [to] create a progressive system of study and workshops moving from the skill based to the academic
     and abstract .
   ? [to] create a series of options to facilitate general awareness of the changes in multimedia
     developments (both physical and in thinking), and to support future career choices. "

(O'Donoghue, Potter & Molyneux, 1997)

The scheme also called for "Project deconstruction and critical analysis of multimedia work [as] essential components of each area of work", a mechanism for meta-cognitive activities and reflection within the scheme as a whole.

An examination of an HND provided by the University of Huddersfield in 1997 stands in comparison to these two schemes as an HE rather than FE provider of this qualification. This course developed and taught by the School of Computing & Mathematics offered the following rationale:

" Information (text, images, audio and video) is increasingly being presented in digital form for delivery by computer based systems. The pathway is concerned with applications of the converging technologies of computing, communications (including cable) and digital media, and with supporting the design and production of attractive and imaginative vehicles for learning, entertaining, marketing, information provision and cultural exchange."

(Topping et al, 1997)

Documentation suggests that design activities follow-on in year two from earlier computer related activities in year one, such as resource database management. However two specific aims of this course indicate a mixture of skills training coupled with reflective practices:

" ? To provide an environment for students to develop technical and design skills in producing, and supporting the production of, multimedia.
? To produce diplomats who understand the importance of multimedia in today's world, and have the technical and design skills to communicate effectively using the tools and structures of the new media".

(Topping et al, 1997)

Comparing these schemes to more recent activities allows us to investigate the possibility of a development in understanding or an evolution in what is understood by multimedia.

One related module to an existing degree programme in Educational Studies at Keele University, UK, is called 'New Learning and its Technologies' and is designed to:

"...develop the skills and theoretical knowledge and understanding necessary to produce interactive multimedia (IMM) resources for educational purposes. The two main aims of the module are: to introduce students to rationale for the use, design and creation of interactive multimedia resources intended for use in higher education; and to assist students to create an IMM resource that exemplifies good practice in the design and evaluation of such materials".

(McLean and Denning, 2000)

Whilst the paper reports a variety of findings on how students progressed with the module and took on a variety of roles to complete their tasks, from the course design viewpoint it is interesting to note that the multimedia component forms part of the *context* for the subject matter, i.e. multimedia is not studied alongside other s ubject materials independently, but is used to *produce and reflect* upon course materials as a means of providing a deeper insight into or to offer a new viewpoint towards subject based theoretical knowledge.

Further evidence of multimedia production, design and evaluation used to exemplify subject skills has also been identified in other schemes, including a degree scheme in 'Interactive Multimedia Arts and Animation'. (Potter et al., 2000).

As a result of these reviews there are indications that a number of multimedia related courses may have moved from a position of relatively independent study of technical skills and creative design to one of *contextual* support and communication embedded in other subject domains. The extent to which this situation is supported is, as yet, undetermined, and it seems likely that some HEIs will offer multimedia with a subject option with little thought of cross-over of context or reflective practices for financial reasons. However, these glimpses of change add purpose to a more detailed study of all 617 course structures and rationales available. This work is currently in progress[7].

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[7] We expect to be able to report on this work during our presentation.

Learning outcomes from multimedia course provision

With such a wide array of multimedia and subject topics available it seems appropriate to question the learning outcomes from such studies. As many of these courses are new there are few students who can yet be questioned on their experiences, skills and concepts of multimedia as a result of their study. However, one such evaluation on students perceptions of multimedia allowed us to make an initial examination of possibilities.

The evaluation was carried out with 12 students participating on a HND in Multimedia course at Knowsley Community College, UK (O'Donoghue and Machell, 2000). During the first year of the course students were asked to define multimedia. Answered tended to focus into two groups;

- those which split multimedia into components for production and integration, e.g. "Visual, sound, text and video, within a digital format that can be accessed and navigated by the user"
- those which were more generic by nature, e.g. "Multimedia is the ways in which to communicate, changing a situation by decision", "A computer course with a bit of everything".

The course design consisted of a six month period of intense skills development with a range of authoring tools, graphics packages, and audio-video software, followed by a period of project work which included industrial work placements and transnational project visits. When the students were interviewed one year later their definitions of multimedia were now related to their project work and their experiences which they used as a frame of reference to explain applications rather than the stand-alone definitions previously reported.

In his examination of learning towards a synthesis for networked learning environments and online communities, Goodyear (2002) provides an account of three kinds of knowledge (academic, generic and reflexive). In doing this he introduces the term 'Working Knowledge' to which he assigns a number of attributes including "knowledge which is relevant to one's own work (when the work may be in academia or in what other people take to be the real world)" and "the idea of knowledge and knowing as an active and dynamic rather than passive and static". He goes on to add:

"Learning in higher education should be imbued with a belief in the particular value of 'working knowledge'. Understanding and engaging with different 'ways of knowing' is key to effective action in academia *and* in the workplaces of today's knowledge economy'.'

(Goodyear, 2002:55)

Developing Goodyear's theme to contextualised multimedia learning, it is possible to suggest that the skills of manipulation and production with a variety of contexts become a 'Working knowledge' which the multimedia graduate can build on, in which case, the study of multimedia within a hybrid course or alongside a subject base may have many benefits, especially in meeting employers' expectations (see Harvey and Mason, 1996). However, there are also other themes and issues to consider, not least those of Wild and Quinn (1998) who "... advocate the development of a coherent model or models of instructional design in multimedia", and those of McLean and Denning (2000) who have adopted a constructivist approach to Interactive Multimedia Learning. More data is required on student's ideas and abilities in multimedia as a consequence of the many courses now available in order to determine the relationships between course design, rationale, tuition, and skills and concept development.

Summary

In this paper we have provided data and analysis on 617 courses available in the UK which make reference to or use of the term 'multimedia'. A large number of such courses (78%) offer multimedia or one of its curriculum variants with a specific topic. Whilst many of these topics appear to compliment the use and application of multimedia and its associated technologies, other do not appear to do so immediately. This gives rise to speculation that some HEIs may be offering courses with a component of multimedia to attract students who may not otherwise attend specific courses or institutions. Analysis of course provision suggests that multimedia related courses have increased in Arts and Humanities subject areas, and in Management and Business related subject areas, more than in computing or other ICT related areas, though the authors acknowledge limitations due to subjectivity of classification.

A limited examination of course rationales suggests that multimedia course design may have undergone a shift of focus, from an almost independent skills-based and technology-led provision, to one in which multimedia is used within a specific subject context. The benefits of this kind of course provision in relation to learning have been briefly discussed, though it is recognised that this area is worthy of more detailed debate and was not intended as a principal focus for this study.

Implication for multimedia course designers and tutors

If such a shift in the focus of multimedia learning has taken place, perhaps in other countries as may be happening in the UK, a series of questions arise with broader implications for tutors, course managers and students, not least with assessment procedures, quality of tuition and work produced, teaching strategies, and whether industries dependent on students emerging with a multimedia qualification, especially in a subject related variant, find such graduates preferable to those with perhaps a single technical or design focus. There are also implications for resources which multimedia course managers need to contend with, such as access to equipment, actually time spent in multimedia production activities, and staff training for non-technical tutors asked to participate in forms of multimedia production or learning activities[8]. Perhaps the area with the greatest implication we are currently examining relates to what we may think of as the *essence* of multimedia; if our indications of the movement of multimedia from independent subject to embedded communication and reflective medium for other curriculum subjects are true, then perhaps a rethink of multimedia teaching is required in order to best suit the needs of students, employers, and academic non-multimedia subject specialists.

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[8] Some of these issues are raised by McLean and Denning (2000) and we expect to report on this situation in more detail during our presentation.

Finally, on completion of this study, we asked ourselves the question whether it was appropriate to remove the term *multimedia* from the title of our own new degree scheme. Insofar as we have given the multimedia components much thought and considered constructive and re-constructive methods for employing multimedia in the communication and the contextualisation of theories of learning, replacing *multimedia* in the title would seem to be a more accurate description of the content and activities of the course. Additionally, in marketing terms, given the relatively few courses we were able to identify within Social Sciences with a learning component (see diagram 1), the inclusion of the term, within the multimedia learning arena as a whole, would appear to represent a purposeful promotional opportunity for the department and the university, but we consider this secondary to the quality of course provision and the course design.

Bibliography

England. E. and Finney, A. (1999) 'Managing multimedia: project management for interactive media', Addison Wesley.

Goodyear, P (2002) 'Psychological foundations for networked learning', in Steeples, C. and Jones, C. *Networked Learning: Perspectives and issues*, pp 49-75. Springer.

Harvey, L. and Mason. S. (1996) 'A quality graduate' in Tait, J. and Knight, P. (Eds) *The management of independent learning* pp 13-28. London. Kogan-Page.

Marton, F. and Säljö, R., (1976a) 'On qualitative differences in learning I - outcome and process', in *British Journal of Educational Psychology*, Volume 46, pp 4-11

Marton, F. and Säljö, R., (1976b) 'On qualitative differences in learning II - outcome as a function of the learner's conception of the task', *in British Journal of Educational Psychology*, Volume 46, pp 115-127

McLean, M and Denning, T. (2000) 'Learning by developing interactive multimedia resources' in 'Improving Student Learning: Proceedings of the 7th International symposium' Published by Oxford Brookes University

O'Donoghue, M.J. (1996) 'BTEC Higher National Diploma in Multimedia'. Course design and specification documents, Department of Research and Development, Halton College, UK.

O'Donoghue, M.J and Machell, J. (1999) 'Multimedia development project at Knowlsey Community College: Initial evaluation of the multimedia Training Programme'. Report for the Centre for the Study of Education and Training (CSEC), Lancaster University, UK

O'Donoghue, M.J and Machell, J. (2000) 'Multimedia development project at Knowlsey Community College: Final evaluation of the multimedia Training Programme'. Report for the Centre for the Study of Education and Training (CSEC), Lancaster University, UK

O'Donoghue, M.J. , Potter, C.A. and Molyneux, P. (1997) 'BA/BSc in Multimedia: provisional structure proposal and pathways'. Course design and specification documents, Department of Research and Development, Halton College, UK.

Potter, C.A. et al (2000) 'Interactive Multimedia Arts and Animation'. Course design and specification documents, College of Art, St.Helens College, UK.

Säljö, R., (1998) 'Learning in educational settings: methods of inquiry', in Ramsden. P, (ed.) *Improving Learning: New Perspectives*, pp 32-48. London Kogan-Page.

Topping, D. et al (1997) 'HND Multimedia'. Course design and specification documents, School of Computing and Mathematics, University of Huddersfield, UK.

Wild, M. and Quinn, C. (1998) 'Implications of educational theory for the design of instructional multimedia', British Journal of Educational Technology, vol. 29, number 1, pp 73-82.
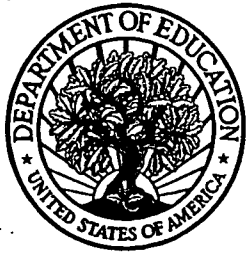
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