

10 Selecting course materials and technologies

Function in teacher education and development

Strengths

Limitations and requirements

PRINT

Provides information, concepts and examples in a structured way.	A learning resource in a permanent form, permitting individual or group use.	Physical distribution of the materials can be slow or difficult in some contexts. Fixed content, not quickly responsive to sudden changes in school curricula or educational legislation or teacher education curricula.
Can teach academic subject content, education theory and knowledge about pedagogy.	A portable and convenient resource. Copies can be used by more than one teacher.	Requires relatively lengthy preparation time and team-working by those producing the materials.
Can link subject knowledge to school curricula and teaching methods.	Good for explaining theory and concepts and providing detailed information.	Cannot show teaching-learning interaction at work in real time in classrooms. As a standardised resource, it may not meet the needs of minority groups or languages, or regional variation.
Can combine expert input with teacher-produced materials. Can show teachers' lesson plans, extracts from teachers' diaries and accounts, diagrams of classroom or equipment layout and examples of pupils' work.	Can include a variety of source materials. Can be low cost but scale affects costs. Provides a common standardised resource.	A one-way medium. Interaction is possible with the material, with the school environment applying ideas from the materials, with other teachers in local groups or with tutors.
Can provide transcripts of teacher-pupil interaction for analysis.	If well designed, can combine effectively with other media.	
Can provide guides to action for teachers (e.g. in implementing new curricula or doing action research).	Can play a variety of roles, from lead medium to supplementary resource.	

RADIO

Provides topical information and current news for teachers.	Often widely accessible by teachers	Ephemeral or impermanent, content lost unless recorded.
Illustrates text content or addresses educational issues in a lively way, using authentic voices and varied sources (teachers, policy-makers, parents, curriculum developers, education experts).	Can be responsive to teachers' needs within a short time-scale.	Scheduled transmission times may be inconvenient.
Can raise awareness about education in a wider community audience.	Provides immediacy in the materials. Can be very low cost per teacher. Equipment for production can be simple, relatively inexpensive and durable. Use of local radio can increase the relevance of programmes and respond to local needs or languages.	Has a poor and unglamorous image. Needs teamwork and collaboration when integrated with other media (can be difficult to achieve in practice). Often limited by regulatory framework for broadcasting or lack of enabling policy for educational use. Commercialisation of radio increasing costs for production or transmission. Weak in conveying detailed or conceptually dense material. One way medium.
Offers a forum for teacher exchanges (teachers' voices).	Programmes can take a variety of formats and fulfil different purposes: a flexible medium.	
Can reach all or most teachers at the same time to support faster and more widespread information dissemination.	Can integrate effectively with print.	

INTERACTIVE RADIO

Provides well-structured lessons for teachers and pupils alike in a range of subjects.	Has proved effective in several contexts for teaching English as a second language, maths and other subjects.	Scheduling may be at inappropriate times.
Compensates for weak teacher-knowledge and can improve it at the same	Can reach a mass audience at relatively low cost per learner.	Depends on regular and reliable transmission facilities and broadcasting infrastructure. Cassette tapes can substitute but lose immediacy and need physical distribution.
Function in teacher education and development	Can support teachers in subject knowledge and in demonstrating new teaching methods	Needs skilled programme designers and structures for teacher support with training for them where interactive radio is new.
	Structures active learning as part of the lesson	A one-way medium. Interaction is with materials, with and between children in class and ideally with other teachers.
	Can provide models of lessons	

Function in teacher education and development**Strengths****Limitations and requirements****AUDIO-CASSETTE TAPES**

Provides illustrations through sound. Can give examples of concepts and theory. Can convey information.

Can provide discussion in a more natural way than through text.

Can provide detailed instructions (e.g. in using a computer or manipulating equipment).

Can provide sequences of conversation for close analysis.

Can be used as a teachers' 'talking newsletter'.

Can provide models of pronunciation. Can act as a 'voice in the ear', to guide teachers through processes (e.g. learning to use a computer or observation tasks)

Offers a permanent resource for individuals or groups.

Is relatively portable. Cassette players are often widely accessible by teachers. Can be re-played, stopped and started at will by learner.

Combines effectively with print, and can extend the use of radio programmes through recording for re-play. Is low cost to develop and duplicate. Can be a more intimate or motivating medium than print, if not presented as a single-voice long lecture.

Provides good models in language learning and teaching, and sequences of natural conversation. Can demonstrate communicative approaches in language teaching.

Teachers can contribute to tapes or make them.

Can be used by tutors to give feedback to students.

Audio-cassettes can deteriorate over time. Sound quality can be poor if a chain of recordings are made or if the equipment is poor.

Cassettes need good management (e.g. accurate labelling, storing, mechanisms for circulating among teachers).

Can fail to stimulate active learning if used just to deliver lectures. Tape-editing time often under-estimated.

Needs skilled integration with print or other media.

Content often needs designing differently from radio programmes. A one-way medium.

CD-ROM (COMPACT DISK-READ ONLY MEMORY)

Provides access to information for teachers in text, graphics, audio and video form.

Can provide information on curricula content and teaching methods.

Can store large amounts of information on one disk.

Relatively cheap and simple to copy and distribute.

Provides random access to content, so a particular segment can be located without having to rewind as in audio-cassettes.

Can substitute for lack of access to data-bases where computers lack connection to Internet.

Requires a computer with CD-ROM drive and software to access the disk. Stores less audio material than audio-cassette tapes.

More expensive than audio-tapes. Making CD-ROM interactive increases development costs.

TELEVISION

Can reach a mass audience of teachers and the community.

Can raise awareness in the community at large about educational issues and teaching.

Shows processes in real-time or slowed down or in close-up (e.g. classroom interaction, language development, mathematical operations).

Shows a variety of school and classroom contexts and teachers in action which teachers would not otherwise see, given the isolated nature of teachers' work. Gives teachers comparisons and benchmarks.

Can show specialists or experts at work.

Provides material as the basis of group discussion.

Can demonstrate real contexts and provide rich visual content. Can capture classroom realities.

Can combine a variety of content (e.g. site visits to schools; interviews,

dynamic simulations, and examples of teachers' work).

Can be combined with other media. Can provide topical content.

High programme development costs and may be high transmission costs. But modest cost per viewer possible on large enough scale.

Not always accessible to all teachers. Inadequate technical support at local level sometimes leaves non-functioning equipment.

Often inappropriate transmission times for teachers.

Sometimes replicates traditional lecture formats which fail to make effective use of the medium's capabilities.

One-way medium. May foster passive viewing.

Filming in schools requires considerable specialist skills and resources. Filming in studio classrooms is often easier but can lack authenticity.

Function in teacher education and development**Strengths****Limitations and requirements****VIDEO-CASSETTE**

Shows processes in real-time or slowed down.

Shows a variety of school and classroom contexts and teachers at work which the viewing teachers would not otherwise see.

Can provide separate segments for close analysis relating to different parts of the course materials, not only long sequences.

Commercially-produced video-cassettes, for example, on child development or other educational topics, can be 're-purposed' for particular educational uses (segments selected and printed guides produced in relation to them).

Can be relatively low cost, depending on development costs and scale of use. Has some of the strengths of television but can be used in different ways for learning (under the control of the learner who can stop, start and re-play sequences).

Can provide material for close observation and analysis, if teacher is guided either on the cassette or in print. Can be used by individual teachers or groups. Can be combined with print. Is a permanent resource.

It can: support active learning with good instructional design; demonstrate teachers' beliefs and practices; stimulate discussion; show the realities of teaching in different schools and compensate for teachers' lack of access to other schools; show simulations and role play (e.g. in head teacher training) or children's work.

Requires physical distribution of video-cassettes and access to playback facilities convenient for teachers.

Quality (picture and sound) can deteriorate if copies of copies are made, rather than from the master tape.

The cassettes need good management (accurate labelling, storing, mechanisms for circulation).

Their role needs to be carefully designed to embed them in the course materials or in relation to active learning, if they are not to be a marginal resource.

Video may be poor technical quality (poor lighting and sound, one camera recording only the teacher (not the children) and poor educational quality (e.g. presentation of whole 45 minute lesson). Editing time is often underestimated. Needs professional makers to achieve good quality.

VIDEO USE IN MICRO-TEACHING

Provides a means for student-teachers to observe themselves on recorded video in a teaching situation or simulation, and to get feedback on their performance through viewing the video and discussion with tutor and peers. Provides student-teachers with an opportunity for observing, interpreting and discussing the video material. Provides opportunities for observing and comparing the performance of self with others.

Is effective up to a point, in assisting student-teachers to appraise their own and others' performance and assist the initiation of reflective practice.

Provides opportunities for practice and experiment followed by feedback; helps the student-teacher develop specific skills (such as questioning, explaining, managing time-on-task, setting up group-work, using a particular teaching method).

A short amount of recording can generate a large amount of discussion and analysis (5-10 minutes of recording can generate at least an hour of analysis and feedback) with a skilled tutor.

Gives attention to the individual student-teacher.

Is labour-intensive and small scale, therefore relatively high cost as a form of face-to-face teaching.

Effectiveness depends on the quality of the tutor or facilitator, the preparation by tutor and student-teacher, the tutor's skill in facilitation and timing of feedback.

Has been criticised as concentrating on isolated, decontextualised and specific teaching skills or competences rather than deep understanding.

Requires a room to be set up appropriately as a classroom, with adequate lighting and equipment but can be relatively low-cost to set up. More difficult to do over a distance.

AUDIO TELE-CONFERENCING

Enables real-time interaction among teachers and educators in different locations.

Can bring together teachers, curriculum developers, specialists and policy makers in one event.

Can be used for presentations and teaching sessions, discussions, course delivery (in combination with other media) and student support.

Can support development of teachers across large distances enabling contact between groups.

Is relatively easy to use (no large amount of technical know-how to master).

Can be cost effective but depends on context and comparisons with alternatives.

Can provide topical content at short notice more easily than print (has the immediacy (or more) of radio).

Can be combined with video-conferencing (one-way video, two-way audio) to reduce video-conferencing costs and to provide interactivity where the infrastructure or budget does not support two-way video-conferencing.

Facilitating group discussion across a number of sites needs high levels of skills and preparation.

Requires advance organisation, scheduling and coordination to make the event successful.

Special equipment needed so that learners usually have to travel to venue. Costs vary in different countries, but can be cost effective when compared with alternatives.

Requires adequate telecommunications infrastructure to function and ensure adequate sound quality.

Requires additional materials or two-way graphics for some topics and subjects.

Function in teacher education and development	Strengths	Limitations and requirements
VIDEO-CONFERENCING		
Enables real-time interaction among teachers and educators in different locations.	Can support development of teachers across large distances, enabling contact between groups.	Has high start-up costs; usage levels need to be high enough to recover them. Requires technical support, including at remote sites.
Can bring together teachers, curriculum developers, specialists and policy makers in one event.	Can provide topical content at short notice more easily than print (has the immediacy (or more) of radio).	Requires students to travel to venue; given the cost of equipping sites, these are likely to be less local than options using different technologies.
Can be used for presentations and teaching sessions, discussions, course delivery (in combination with other media) and student support.	Can make scarce expertise available widely.	Where teacher interaction is possible at the local or district level, video-conferencing is likely to be a more expensive option. Where teachers travel long distances to in-service events, the video-conferencing option may be more cost-effective.
Can show a variety of visual materials to participants.		The added costs of the visual dimension may not provide matching benefits over audio-alone.
COMPUTERS		
Provides access to information on CD-rom and local databases. A means of preparing materials for teaching if consumables are available (e.g. cartridges, paper).	Can provide access to large amounts of resources for teachers to select from and use as appropriate in their own contexts or for their own development. Its use helps teachers to develop their own personal computer skills.	The quality of software or learning programmes is sometimes poor. Technical support is needed and may be scarce in rural areas.
Provides computer-based learning materials for teachers and pupils.		Access is sometimes restricted for teachers. Training for teachers may be too little, and too narrowly focused on using the computer rather than using it for teaching and learning across the curriculum.
COMPUTER COMMUNICATION		
Enables teachers to participate in larger professional communities, beyond their local ones.	Can provide a wide range of multi-media materials, if the infrastructure (and bandwidth) permit.	Problems of access and cost in some countries. Requires an adequate infrastructure (electricity, telecommunications), affordable prices, supportive policy framework and investment of resources.
Provides access to databases, either on a local area network provided by the education authorities, or the Internet. Enables teachers to follow professional development programmes provided by remote institutions.	Supports a range of interaction, from formal to informal of varying group size Can archive discussions for later use by other teachers.	Requires a change in perceptions and practices in teaching and learning (in contrast to common perception that having computer communications will of itself improve the quality of teaching and learning).
	Allows teachers to participate widely and to exchange experience and materials in peer groups.	
	Provides access to more sources of information and assistance, on topics from the specific ('How do I teach the new curriculum on environmental studies to Grade 3 children?') to more general educational topics.	If lengthy print materials are produced through downloading, this may increase costs per copy over those of centralised print production and shift costs to the teacher, school or district.
		Requires training for effective use (often neglected).
		Requires considerable technical support.

Source: Perraton et al. 2002.