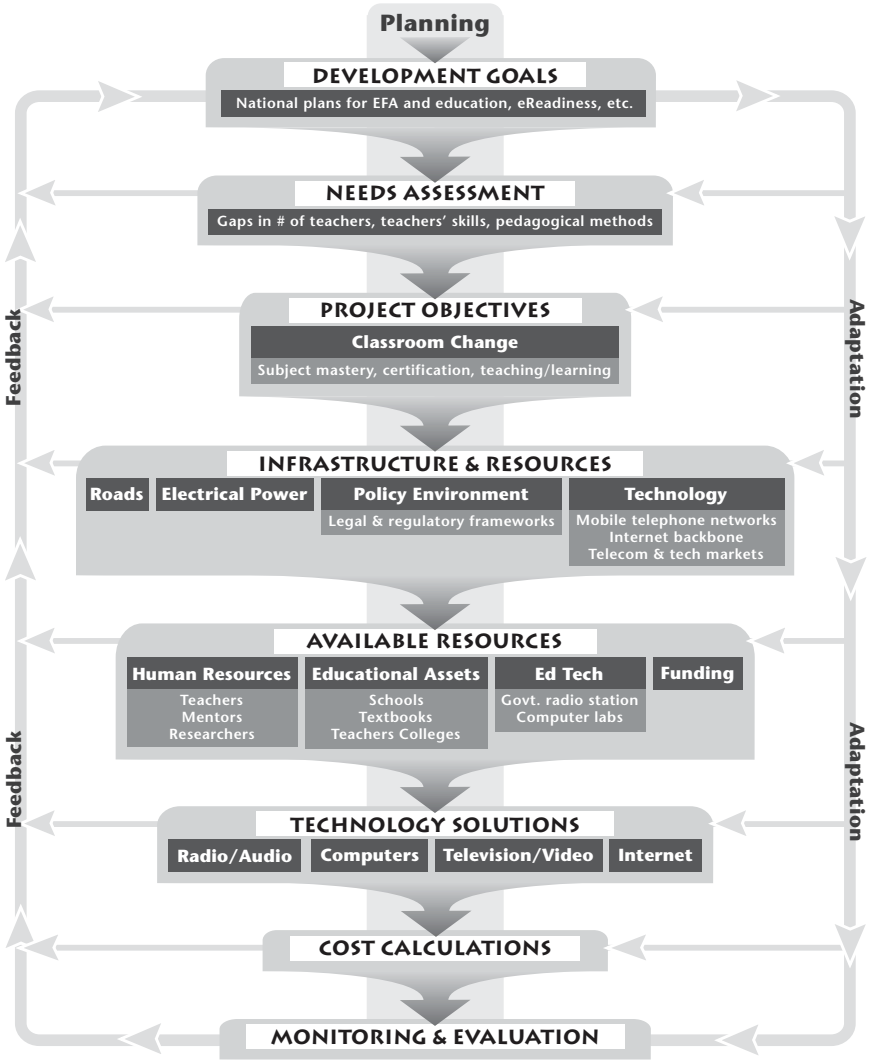
SECTION 2
ICTs FOR TEACHER PROFESSIONAL DEVELOPMENT AT A GLANCE

Tables in this section offer overviews of the education-related characteristics of key technologies used to support TPD. Use the tables to compare tools in relation to program objectives. Refer to Figure 1 below for an overview of a planning process to be used in conjunction with this handbook.

FIGURE 1: PLANNING PROCESS FOR ICT-SUPPORTED TPD COMPUTERS AND THE INTERNET IN TPD AT A GLANCE



COMPUTERS AND THE INTERNET IN TPD AT A GLANCE

Roles in TPD & education

- Provide productivity tools to write reports, make presentations, communicate, design animations, build Web sites, etc.
- Provide access to guided TPD resources and collaborative environments, and enable the creation of online communities of practice
- Enable acquisition of basic computer skills Internet Computer Driver's License (ICDL), design skills (e.g., Web pages), programming, and hardware maintenance and repair
- Provide tools (e.g., spreadsheets, databases) that promote higher-order thinking

Strengths

- Flexible and powerful—can be used to develop materials, access resources, and communicate
- Multiple media and platforms combine text, audio, video, animation, and interactivity
- Centralized and decentralized communication supports dissemination of resources and essential feedback from schools
- May enable learner-centered and active-learning pedagogies
- Enable communication with experts—including TPD mentors, master teachers, and help desks
- Improve subject mastery through Computer-Assisted Instruction (CAI), simulations, and other tools
- Provide support for collaboration—individuals, pairs, and groups of teachers or students can use computers to collaborate online and face-to-face
- Support assessment and recordkeeping—accredited ODL courses, electronic portfolios, etc.
- Potential for revision and new versions supports reflection, self-assessment, and other learning-related activities

Limitations

- Complex tools require both time and TPD to be effective
- Hardware, software, and operating-systems are fragile—subject to damage by users, viruses, fluctuating electrical power, etc.
- Hardware and software lose value and utility as they age—corporate and institutional users plan on 3 years of service
- Highly dependent on infrastructure—electrical, telecommunications, road (for repairs), and human (for maintenance and management)
- Without support from leadership and system-wide commitment to new modes of teaching and learning, impact is limited

Cost profile

- Variable production costs—new software tools (e.g., Flash, Director, etc.) drive down production costs of digital content
- Variable content-distribution costs are contingent on Internet connectivity and resource format
- Significant installation, maintenance, and repair costs
- Total Cost of Ownership (TCO) model mandates periodic upgrades

Other considerations

- May contribute to overall e-Readiness
- Advances in wireless, VSAT, and other communications tools may increase Internet access
- Advances in hardware design may increase ruggedness and decrease power requirements
- Mobile devices (handheld computers, phones) have potential to change TPD-focused communications and access to resources
- Focus on tools may distract from curriculum-centered learning

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RADIO AND THE INTERNET IN TPD AT A GLANCE

Roles in TPD & education

- Addresses shortages of trained teachers
- Basic-skills instruction—math, health, language-of-instruction (English, French, etc.)
- Promotes teacher development, primarily via demonstration, guided and hands-on classroom management, and building subject knowledge

Strengths

- Can lead to improvements in basic skills
- Proven curricula in basic math, language arts, health, Early Childhood Care and Development (ECCD)
- May be implemented with or without textbooks and other resources
- Potential to reach large student populations
- Lack of literacy skills not a barrier
- Addresses equity and access issues (gender, ethnic, rural)
- Can combine hands-on development of teacher skills with student learning
- Audio learning may support visualization and concept-building by learners
- Enables instructional continuity across grades and subjects
- Radio production skills are widespread
- Durable, survives extreme environments and long-term use with minimal care
- Moderate infrastructure requirements
- Low technical-support requirements

Limitations

- Value of content may degrade over time—long-running programs must evolve with schools and education systems
- Broadcast airwaves are subject to political and economic events
- Tendency to reinforce rote learning models— interactivity is limited, attention to needs of individual learners is limited
- Fixed broadcast schedule
- Linear, one-size-fits-all approach
- Risk of student and teacher dissatisfaction —including boredom, especially when lessons are broadcast daily
- Hardware-replacement programs are necessary: Radios and batteries may be stolen or borrowed

Cost profile

- High to moderate content-development costs
- Start-up includes cost of radios, cassette players, tapes, batteries, materials development, and training
- Per-student recurrent costs of large-scale programs are very low
- Funding may combine contributions from ministries of communication, broadcast authorities, private radio networks, parents' groups, and others
- Low recurrent cost has not ensured sustainability

Other considerations

- Advance research and formative evaluation are essential for success
- Impact is increased by teacher development, printed materials, school site visits and other means
- May incorporate songs, use of real-world objectives (e.g., pebbles or beans as math manipulatives), in-class experiments, pair- and group-work and other active-learning elements
- Limited quantitative evidence of impact on teacher development
- Can be used in combination with other technologies, such as video or "pod-casting"—teachers may adopt radio-delivered classroom practices when they see examples on video

TELEVISION IN TPD AT A GLANCE

Roles in TPD & education

- Addresses shortages of trained teachers
- Is a primary means of delivering content and concepts to students across the curriculum
- Used in development of teacher skills and knowledge
- Provides views of real classroom practices and learning activities
- Provides teachers with learning resources that show distant places, graphical representations of concepts, historical events, etc.

Strengths

- Is both powerful (moving images, audio, etc.) and familiar
- Can be used to "bring" viewers to the site of events and phenomena
- Helps teachers implement new techniques effectively by observing demonstrations of classroom management and other teaching practices
- Has the potential to reach large populations of students and teachers
- Addresses equity and access issues—although access requires electrical power
- Supports instructional continuity across grades and subjects

Limitations

- As a visual medium, does not guide teacher through scripted, hands-on classroom activities—unlike radio, television promotes "watch and learn," not "do and learn"
- Involves high development costs which may limit testing, review, and revision before programming is launched
- Value of content may degrade over time—costs of revisions and new programming are high; visual images "show their age"
- Broadcasts are subject to external political and economic disruptions
- Television production requires sophisticated skills and facilities
- Costs of production and airtime may influence programming to reach audiences outside of schools
- Fixed broadcast schedule—can be augmented by taping
- Limited by access to electrical power
- Hardware costs for reception (television, satellite dish, cabling) and power generation may be too high for poor communities and schools

Cost profile

- High production costs—often US$1,000 per minute
- Commercial broadcast rates are very high
- Local installation includes cost of television, satellite dish (in rural locations)
- Per-student recurrent costs of large-scale programs are low—but low recurrent costs have not ensured sustainability
- Funding may combine contributions from ministries of communication, broadcast authorities, commercial broadcasters, and others

Other considerations

- Lack of interactivity can be addressed through a range of affordable technologies—fax, email, telephone "call-in" formats
- Impact is increased by teacher development, printed materials, school site visits and other means
- Limited quantitative evidence of impact on teacher development

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VIDEO RECORDING IN TPD AT A GLANCE

Roles in TPD & education

- Demonstrates new modes of teaching and learning through views of real classroom activities (Lesotho video package)
- Video recording of classes shows teachers their own interactions, habits, and progress toward effective teaching

Strengths

- Teachers benefit from seeing other teachers in action
- Teachers benefit from seeing themselves in action
- Video recordings can be used and reused according to teachers' schedules
- Playback controls (rewind, freeze-frame, etc.) enable close analysis of specific events
- Video production tools can be used locally—in schools, by ministries, etc.
- Broadcast quality video is powerful (moving images, audio, etc.) and familiar
- Effective learning resource for teachers and students—can "bring" viewers to events and phenomena to support concept building, retention, etc.

Limitations

- Value of content may degrade over time—costs of revisions and new programming are high; visual images "show their age"
- Video produced by foreign institutions may be ineffective—teachers may not identify with experiences shown outside recognizable contexts
- Poor roads, lack of rural electrical power and other challenges to distribution in LDCs may reinforce differences in education access

Cost profile

- Variable production costs—professional quality is high cost; local (in-school) production can be low cost
- Initial cost of hardware per school is moderate
- Hardware costs are falling—including digital video cameras, storage media (DVDs, hard drives), and players
- Distribution of video content to schools may entail low or moderate cost
- Potential reuse lowers recurrent costs of large-scale programs
- Professional-quality resources may be available at low cost from universities or foundations

Other considerations

- Advances in digital video may increase the value of video for TPD in LDCs—digital video cameras, portable DVD players
- New, powerful mobile phones can shoot low-resolution video clips
- Compression software (e.g., MPEG4, etc.) makes short videos available via CD-ROM and the Internet
- Easy-to-use editing tools enable moderate-quality video production by ministries, universities, and schools

ONLINE DISTANCE LEARNING IN TPD AT A GLANCE

Roles in TPD & education

- Provides structured and unstructured TPD to teachers
- Provides teachers access to learning resources for use with students
- Peer mentoring and teacher communities support TPD initiatives
- Accredited TPD courses help teachers upgrade qualifications

Strengths

- Anytime, anyplace—wherever connection is available
- Teachers can interact with expert teachers and others
- Written communication (email, discussion) can prompt more reflective and considered participation
- Supports a range of learning styles
- Potential to reach large populations of teachers

Limitations

- Dependent on regular access to computers and the Internet
- Teachers must have computer, language and literacy, and teaching skills to participate effectively
- Many self-paced online courses lack high-quality or interactive content—online materials merely replace print materials
- Internet content may be overwhelming—too much and too many choices
- Online mentoring may be less effective than face-to-face
- Multimedia and interactive course materials require high bandwidth and powerful hardware
- Effect of online TPD on classroom practice is unclear

Cost profile

- Low costs when teachers access free TPD sites and content (e.g., iEARN, CENSE)
- High costs when courses have fees (WIDE World)
- Moderate content development costs (online courses, portals, and communities)
- Moderate operating costs for facilitated courses, portals, and communities

Other considerations

- In some countries, may best be used to build capacity among master teachers, mentors, and teacher-college faculty