



Educational Repurposing: Value and Contexts?

Beyond the classroom computer... exploring the potential of novel interactions with innovative technologies in educational settings.
April 30th 2003

Paul Shabajee

(Institute for Learning and Research Technologies)



"A centre of excellence in the development and use of
Information and Communication Technology to support learning and research."



INVESTOR IN PEOPLE

Digital Collections of Multimedia

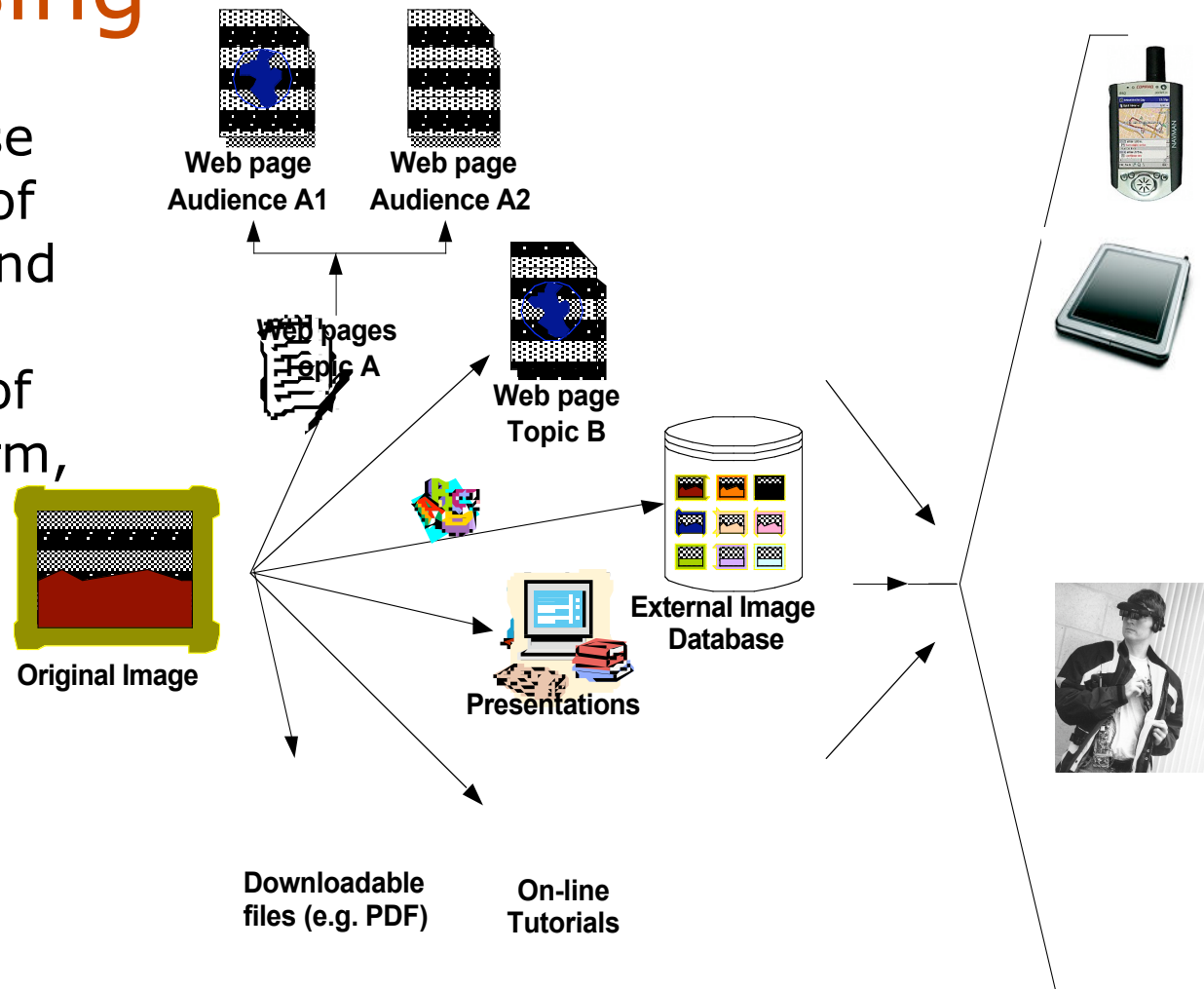
- Millions of £ & \$ invested in development of Very Large Digital Collections of...
 - Priceless Historic and Cultural Objects, Images and Films, 3D Environments, Places and Things Otherwise Inaccessible
 - Future... immersive 3D environments, 'wearable computing' & mobile, new forms of collaboration and interaction...
 - Imagine: If these can be used to support learning and teaching in any relevant subject, phase of education, level of education, utilised to help provide personalised learning resources for individuals.... Anywhere, any time, on anything etc...
 - Want maximum '*educational value*' from of digital collections... up to now narrowly focused.

Digital Collections of Multimedia

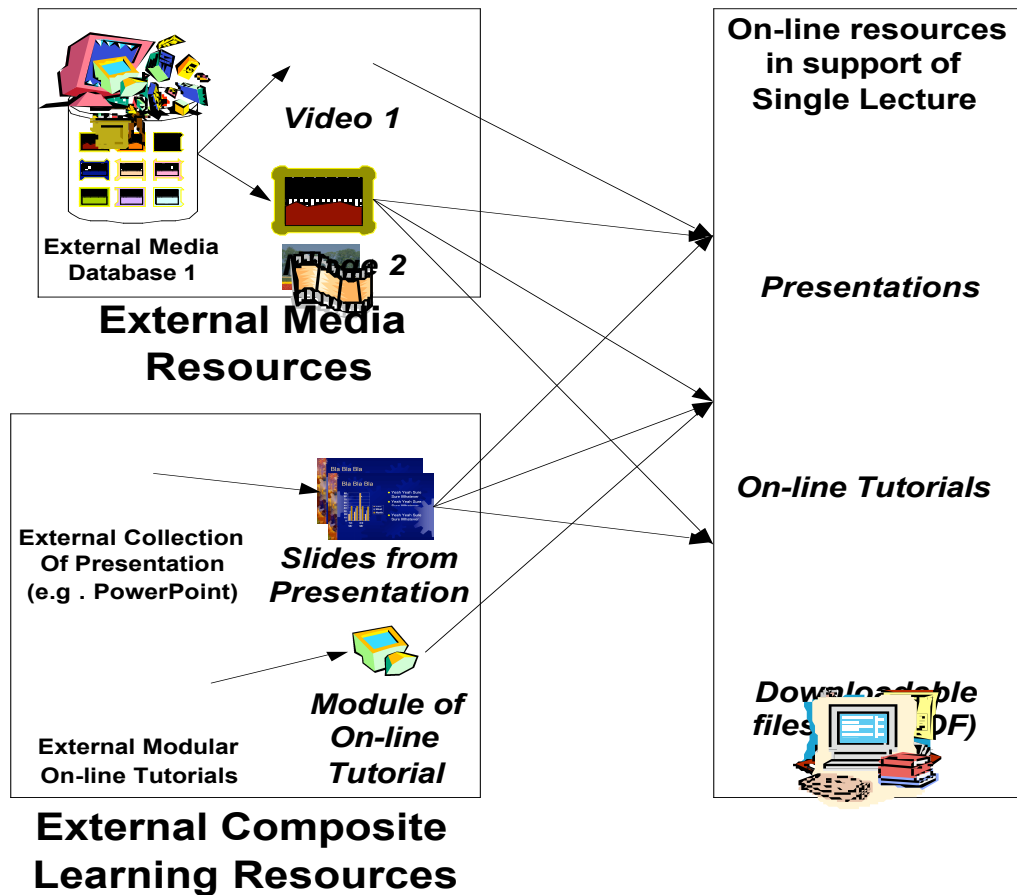
- In the UK... e.g. ARKive
 - 'Multimedia profiles' of Animal, Plant & Fungi + Habitats
 - Phase 1 – 30,000 images, 900hrs video, audio, maps, text...
 - Funding - UK Heritage Lottery Fund (£1.6m), New Opportunities Fund (£0.5m), HP Labs (\$2m for technology research), ...
- Others... SCRAN, British Pathe... other NOF projects, Commercial Organisations and NGOs ...
- ARKive-ERA (Educational Repurposing of Assets) Project – Investigating key issues in designing systems to provide diverse users with appropriate access to multimedia assets...
- Funded by HP Labs as in support of work with ARKive

Repurposing

- Maximising use across range of user groups and individuals. Across types of media, platform, context...



Repurposing



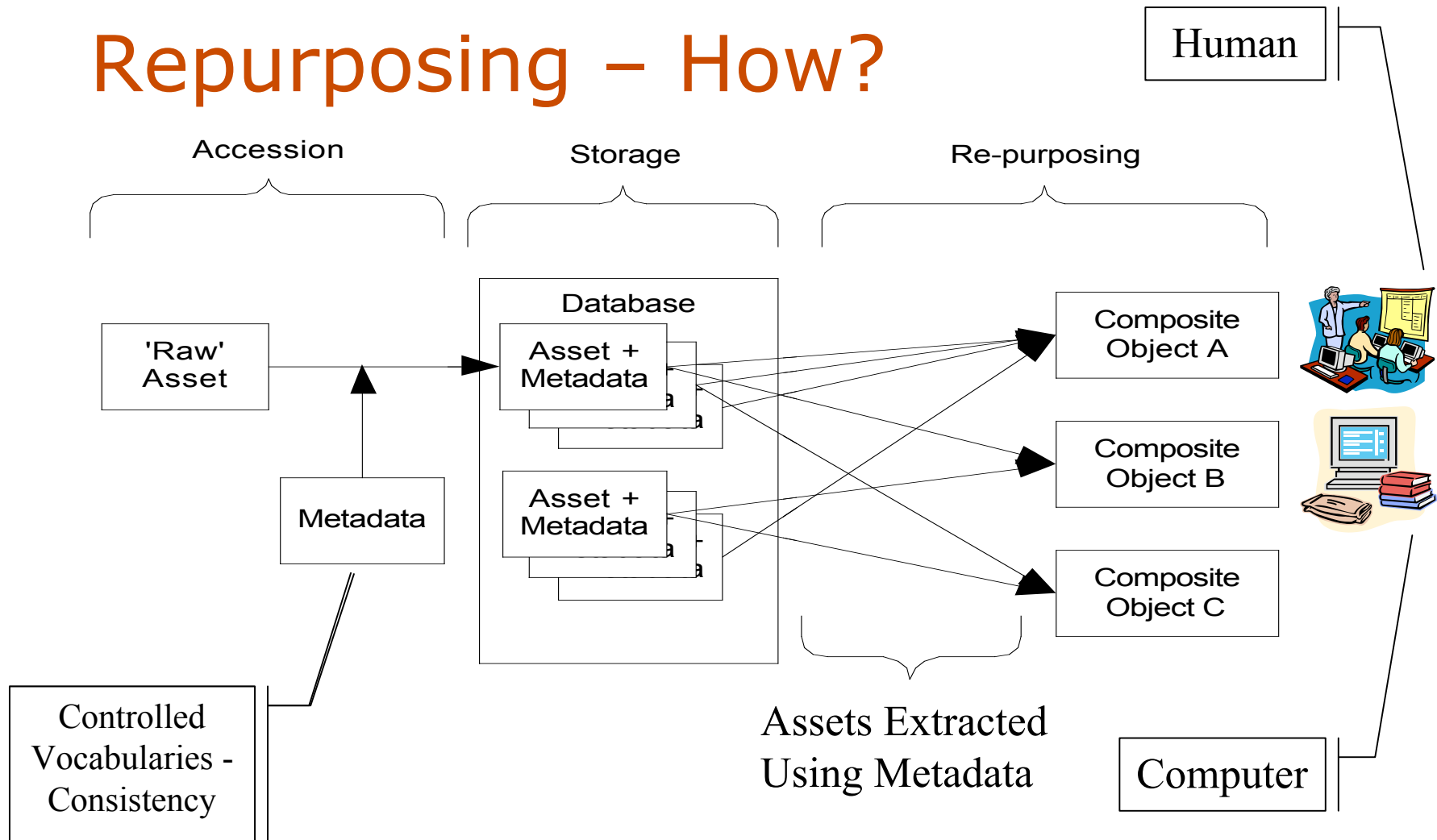
- Pulling together resources from different sources...

The 'best' resources

For them

In their context(s)

Repurposing - How?



The BIG Target... (e.g. ARKive)

- Enable re-use of assets so that ALL 'educational' users gain maximum benefit – BUT!
 - Multiple 'user groups' or individuals
 - Pre-school children, school pupils, teachers, university students, lecturers, researchers, parents, continuing education students, 'casual' learners...
 - Different needs: teaching points, types of query, intellectual levels of content, literacy levels, different ICT capability...
 - Multiple contexts
 - Schools: labs, classrooms, fieldwork, different subjects, different learning styles, different levels & courses, different media quality requirements...
 - ...
 - → Bit complex...

A Simple Problem?

- Imagine that there is a database of 100,000 images of people in a wide variety of different settings
- The database is indexed using terms relating to identification of people (name, age,...) and event (time, place...)
- Now a milliner might see great potential for studying how people use hats.
- The database is likely to be a very useful resource, they could search to see how the style of hats has changed over time, or what types of hats are most popular, what percentage of women have bows on their hats? and many more specific questions
- However the database is not indexed using the concept of 'hat'... there is no 'hatness'...



The Challenge - Repurposing

- Need to get the assets via descriptive metadata...
- Diverse perspectives on any single asset (specialist vocabularies)
 - The Medical Subject Headings (MeSH) - there are more than 20,000 main headings
 - The Art & Architecture Thesaurus (AAT) - contains about 120,000 terms covering objects, textual materials, images, architecture and material culture from antiquity to the present.
 - UK National Curriculum (for schools) Metadata Schema contains some 2000 'subject keywords'
- Comprehensive Description?
 - Costs? Time? Expertise? Which 'standards' to choose?
Who chooses relevance? ...

A Fundamental Dilemma

- Developers (e.g. ARKive) want to enable all potential educational users to gain maximum benefit from the assets held in their database
- They do not want to dictate or second guess how people might use an asset
- However: in order to allow anyone to find anything...
 - in a usable and effective manner
 - with finite time and budgets, to index assets
 - a limited choice of metadata terms must be made...
 - which in turn requires assumptions about the users and likely uses to which the resource might be put!

You don't want to (and can't) predict what your users will want to use the 'raw' multimedia assets for, but if you don't, your users can't get to the assets.

Context? Educational Settings?

- Solutions → Flexible & rich repurposing = ~~flexible and rich~~ description 'machine readable' description of context...
- Soooo...
 - What is an 'educational setting'? ([IEEE LOM](#)?)
 - And how do you describe it?
- Questions?
 - What counts as learning?
 - How much of all learning takes place in formal contexts?
 - How much learning is planned?
 - How much 'learning' is a goal in itself?
 - How ideal is our existing 'education' system? ...
 - ... painting walls with toothpaste

Learning, Context & Interactivity?



- c.1997... Three Asian girls (y6)... not wanting to touch the computer, not interested in wildlife, not seeing the point in the Internet... errr...
- Stop... talk... Indian films... Bollywood... [*start the clock*]
 - can we find out about?... what's this?... oh wow she's great!... what's that... why's it so slow? why can't we hear it? Can we get that... how do you d..download? [*now one girl at computer using keyboard*] ... Can we see two at once? How does it know my name? Why's it so slow? Can we speed it up?... what about the video?... my mum would love this, can we print it out?... Yes that's true, it was on the radio. Are there other sites... Oh this song is my favourite!
- Approx. 10 minutes have passed: the girls can open multiple browser windows, download and install plugins (watched once, done it once), are aware of issues that affect download times, can use hyperlinks and browser back/forward buttons, have used search engine and constructed own 'and' based queries...
- ... and can see a 'value' in computer and the Internet.
- 10min long 'learning accident.'

Flexible and Adaptive Futures?

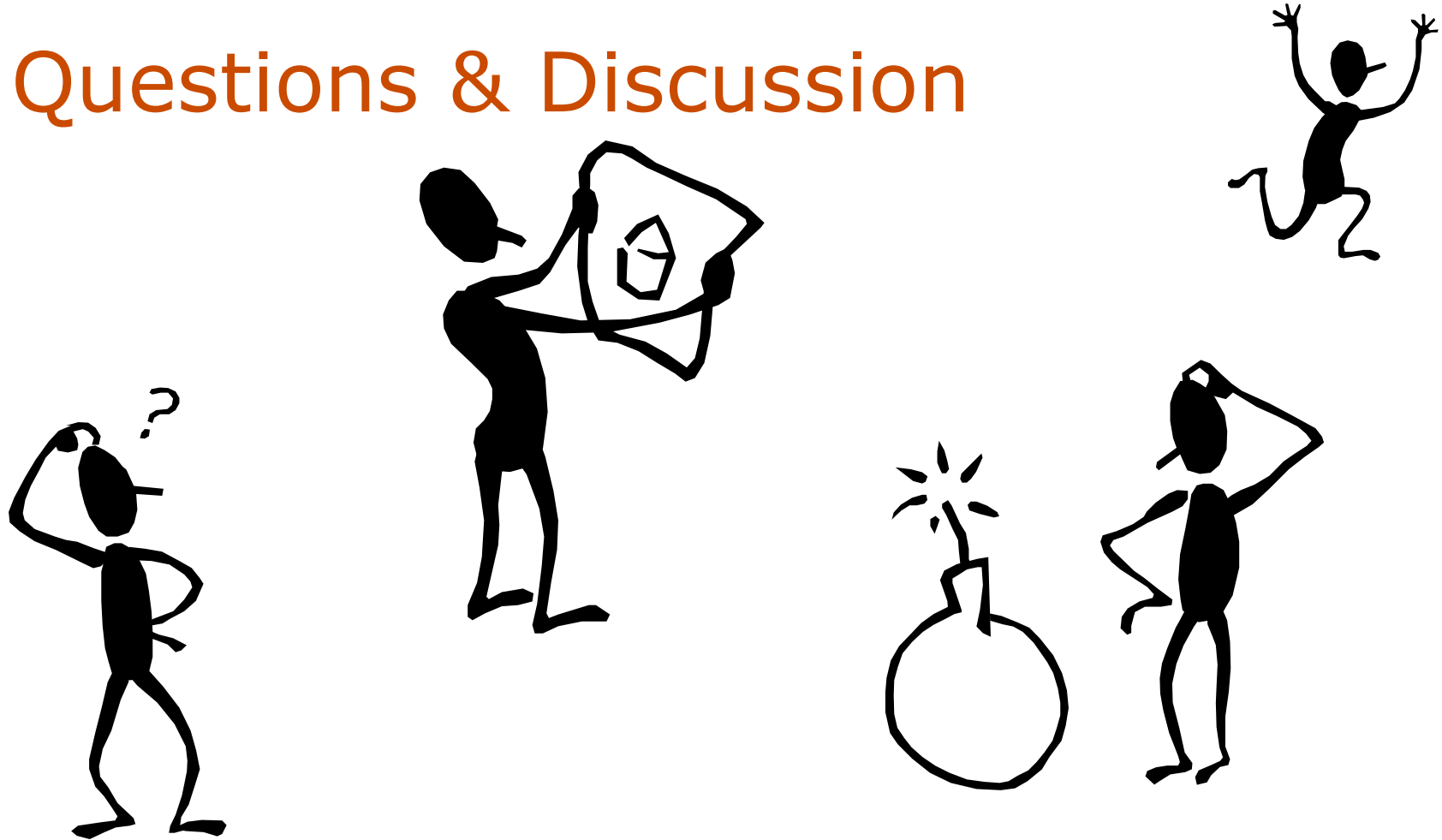
e.g. CAL2003

- Mobile Learning, learning episodes, emergent goals...
Mike Sharples
- Augmented conversations between experts and novices... Paul Rudman
- Voting hand sets & feedback - Contingent teaching... ,
Margaret Brown & Steve Draper
- 3D Environments... Various
- 2-Sigma Problem... Conversations
- ...
- Marshall McLuhan... Medium, message and nature of cognitive processes...

Conclusions

- Repurposing of all types of multimedia objects provides an effective means of maximising their value..
- When combined with new and evolving technologies e.g. Paper++ the potential is literally unimaginable...
- However there are quite fundamental barriers to true 'cross cultural' access to raw assets...
- Creating machine readable definitions of context is central to the majority of solutions...
- This begs old questions about the nature and role of 'education' ...
- So what is an "educational setting"?

Questions & Discussion



IEEE LOM Standard

- Interactivity Type - e.g., Active, Expositive, Mixed, Undefined
- Learning Resource Type - e.g., Exercise, Simulation, Questionnaire, Diagram, Graph, Self Assessment
- Interactivity Level - e.g., very low, low, medium, high, very high
- Semantic Density - e.g., very low, low, medium, high, very high
- Intended End User Role - e.g., Teacher, Author, Learner, Manager
- Context - e.g., Primary Education, Higher Education, University First Cycle, Continuous Formation, Vocational Training
- Typical Age Range - e.g., 7-9, 0-5, 15, 18-,
- Difficulty - e.g., very easy, easy, medium, difficult, very difficult
- Typical Learning Time
- Description
- Language

Education and Schooling?

Child: I'm really looking forward to going to school!

Parent: Oh why's that?

Child: Because I'll be able to learn about the things I want to.

Parent: ... umm but the teachers probably have some things that they will want you to learn...

Child: ... but when I've done those, I can learn about what I want to.