$ vs
Development Time vs
Learner Engagement

Making Effective Trade-Off Decisions
during the
Professional Development
Content Development Process

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White Paper

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Introduction: Process Discipline, Creativity and Program Effectiveness

More and more, professional development programs, as well as academic program, are being delivered in an e-learning format. That complicates the content development process. While preparing e-learning content, developers need to combine the following professional development with their creative abilities and intent.

1. The detail specification needs of software design in its interactivity with a learner and its need to cover all participant's learning styles.

2. The production management and visual design requirements of movie production in e-learning'[s scripting / storyboarding AND rehearsal needs. In film production, even this often leads to script rewrites and re-shooting as original ideas turn out not to work as envisaged when the "first cut" is screened.

3. The sound editing / lip sync management needs of record / record video production when post production voice over is added.

4. The need to follow adult education design principles to maximize adult learning engagement, which results in higher skill transfer back-to the job.

5. The need to do appropriate project management which ensures effective teamwork among what are often "self adsorbed experts" , each with their own ideas and creative styles.

When WCI Press develop professional development content, especially when that content will be delivered in a e-learning, they are constantly faced with "trade-off" decisions. The nature of those decisions is described in what follows. The factors essential to making effective "trade-offs" are set out. Such trade-offs involve the very real considerations of cost, time needed to develop, and eventual program effectiveness.

We hope that this will be helpful to others faced with this extremely exciting and creative task.

The Four Factors that Lead to Maximizing New Capability-Transfer Back to the Job

Over the years that WCI has been involved in professional development, our gold standard for the success of professional development investment is "use of the new skills back on-the-job." Unless the participants on professional development

programs actually use the new capabilities they have acquired, we believe that the program has not been effective.

At the same time, WCI acknowledges that it cannot control all factors needed to maximize on-the-job skill transfer on the part of the attendees.

WCI uses the following conceptual framework to clarify what it takes to maximize capability transfer back to the job.

Participant's amount of skill transfer back to the job is a function of:

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1. Reward / recognition provided by organization to the individual when new behaviours are effectively demonstrated on the job;
2. Opportunities provided by job situation for the individual to apply / use the new skills once back on the job;
3. Effectiveness of the professional development program in "training" participants in new capabilities;
4. Motivation of each participant to learn / acquire the new skills while involved in training program.

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Factors 1- reward / recognition - and Factor 2 – opportunities to apply - are within the domain of the organization. Factor 4 – motivation - is particular to each individual.

WCI focuses on maximizing Factor 3 – effectiveness of training - in its professional development content development work for clients.

Maximizing the Effectiveness of a Professional Development Program

Three factors increase the effectiveness of a professional development program.

1. The first is the **effectiveness of the program content** for the selected audience and for the program's learning objectives. This involves ensuring that the content engages the program participants deeply.

2. The second is the use of an **professional development content development tool set** that supports rapid development, as well as being widely accepted in the professional development community because it allows the development of content that matches the range of learning styles of program participants.

3. The third is the **effectiveness of the program delivery**.

The Effectiveness of Program Content

When an individual opens an professional development program, the engagement of that person with the content is a function of a variety of things. Since the likelihood of skill transfer back to the job is directly related to each individual's engagement with the program, understanding what drives engagement is crucial for professional development content development. WCI uses the following conceptual framework to clarify what it takes to maximize participant engagement.

Participant's engagement is a function of:

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1. The fit of the content material to the learning style of the participant;

2. The fit of the material to the educational and work experience level of the participant;

3. The clarity of the material;

4. The ability of the participant to control the pace of delivery and movement through the material;

5. The relevance of the material to the participant's on-the-job situations and work dynamics,

6. The intrinsic interest of the participant in acquiring the new capabilities.

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Factor 6 – intrinsic interest – is beyond the control of the content developer. Some things can be included in the program in an effort to increase this. For example, organizations often include a statement by a senior organization member at the beginning of a program that explains why this content is important.

WCI's approach to maximizing each of the other factors is addressed in turn.

Maximizing Content Fit to Participant Learning Style

Kolb's Learning Styles are a well accepted definition of the various learning styles that an individual can bring to an professional development experience. Kolb describes 4 different styles. He indicates that each individual has a primary style. The individual may use the others, but to a lesser extent.

1. Learning by **trying: trial and error** = getting immediate feedback from personally trying it out: Kolb's **Active Experimentation** learning style;

2. Learning by **guided doing** = being taken through the steps by a watching / directing coach: Kolb's **Concrete Experience** learning style;

3. Learning by **observing and reflecting** = observing others as they apply / problem solve / learn: Kolb's **Reflective Observation** learning style;

4. Learning by **integrating principles and concepts** = comprehending the concepts and ideas and seeing how they related to other conceptual models / approaches / frameworks: Kolb's **Abstraction Conceptualization** learning style.

WCI addresses each style by including the following kind of content in its professional development programs. We tend to present this material in the sequence below. However, at times we will vary the sequence to order to increase the engagement of individuals whose learning style is not "Learning by Integrating".

Learning Style	Content	Intention
Learning by integration	Conceptual material and frameworks which explain relevant ideas	Provide a scaffolding on which to present the following content

Learning Style	Content	Intention
Learning by trying	A short case or problem which requires the participant to apply the concepts or ideas	Provide immediate feedback on the???? of the participant to apply what he/she is learning
Learning by observing and reflecting	An specific example of how the ideas or concepts are expressed in behaviour, often in the form of a video clip or animated video clip	Allow the person to see examples ; ask him/her questions so that he/she thinks (reflects) about what is being seen
Learning by guided doing	Provide a short case, an example video clip or animated video clip and direct the participant in doing something which is relevant to it	Direct the individual in applying the ideas or concepts in a pragmatic problem-solving way

Doing so increases two costs, however. The first relates to participants; the second to the cost of content development.

First, each core component of the program is covered within 4 ways. This increases the time that each participant could potentially spend on each component. Providing buttons and other controls that allow the participant to move back and forth in the program content partly alleviates this. Individuals can simply move past material that does not correspond to their learning style.

Second, development time must be spent on developing each of the four ways to cover each core component of the program. This increases the cost of content development. This cost is really an investment, since the increased engagement leads to greater skill transfer back to the job.

The following table summarizes some of WCI's experience with making content decision choices to maximize fit to participant learning style.

Learning Style	Kind of Content Required	Comparative Development Cost ($, time to develop)
Learning by trying	1. Problems and Cases 2. Simulations	• Low if presented in words – not always most effective • Higher if they involve video animations, video tape clips, real time simulations

Learning Style	Kind of Content Required	Comparative Development Cost ($, time to develop)
Learning by guided doing	1. Step by step guidance on how to work through typical situations	• Low if presented in words – not always most effective • Higher if they involve video animations, video tape clips, real time simulations • Higher again if it is a real practicum in as close as possible to or in actual on the job environments • Peer mentoring is a viable option if the mentoring peer has the interpersonal and content skills required
Learning by observing and reflecting	1. Samples of effective behaviour 2. Samples of ineffective behaviour 3. Cases / Simulations which involve both	• Low if presented in words – not always most effective • Higher if they involve video animations, video tape clips, real time simulations
Learning by integrating	1. Well done lecture material focused on principles and applications first then application through quizzes, problem solving, mini-case analysis 2. Cases / Simulations which involve both	• Low when presented in words – not always most effective • Higher if they involve video animations, video tape clips, real time simulations

Maximizing Content Fit to Educational and Work Experience Level of the Participant

Content can be explicitly written so that the language level usage suits a particular audience. In general, WCI assumes that participants in professional development programs will have at least some college-level training. This generally makes sense. When this is not the case, then care must be taken to specifically shape the language used in the program to the educational level of the audience.

In some cases, especially when potentially large audiences are involved, it makes sense to invest in a number of alternate versions of the program. Each version is intended for a specific audience, and is authored to use language at a level specific to this audience An example involves developing two versions of a program, one for managers and senior managers, and one for operational staff.

At times, multiple versions must also be created to deal with multiple language requirements. When this is the case, WCI advocates the use of back translation techniques to clients, since one-way translation is usually not enough to ensure effective participant engagement.

In video or animated video content, backgrounds, characters, and clothing, which are as close as possible to the participant's working world, increases engagement and the likelihood of capability transfer back-to-the-job. Doing this increases the expense of content development. WCI works with clients to make realistic trade-offs between such increased development costs and the effectiveness of the program.

Programs field trials and A / B version trials of content also increase the cost of development. However, field trials allow fine tuning of content for representative samples of the final audience. Sometimes, field trials of professional development disclose “counter intuitive and beyond current experience” elements in professional development programs. Field trials often eliminate problems areas that no one can anticipate, even when they apply their best experience and insight to content specification and development.

What seems like a larger initial development cost often does not make a significant difference when the cost per potential participant is calculated. The cost per participant goes down as the cost of development is spread over a larger number of participants. Effective content, which increases participant engagement, has a larger overall payoff, especially if large numbers of participants are involved.

Maximizing the Clarity of the Content

WCI uses behavioural learning objectives to ensure that the content of its professional development programs is clear. A high-level learning outcome defines on-the-job behavioural objective for the overall program, or each major segment of the program. More detailed behavioural objectives break this higher-level objective into specific training objectives for each segment of the program. A detailed outline of the program sets out the flow of the program before any specific content development work is done. This outline is reviewed with clients to make sure that WCI’s work meets client needs.

Each lower-level behavioural objective is categorized under one or more of the following elements of adult education learning typology:

- "Knowing that" **= factual** knowledge
- "Knowing how" = **capability to do** (intellectual / psycho-motor / emotional / full body)

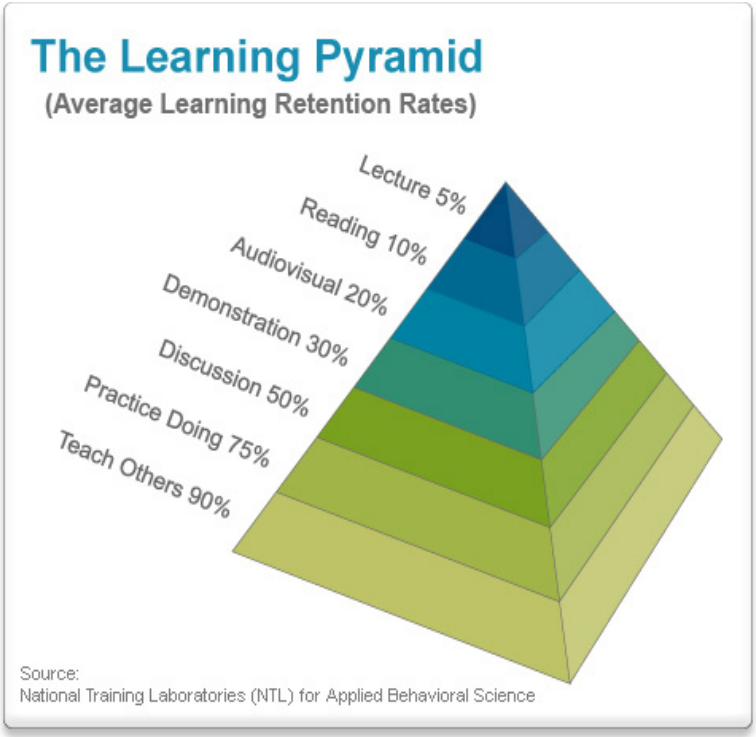
- "Knowing why" = **motivation** / **reasons to do** / **reasons not to do**

Doing so clarifies the nature of the specific activities which must be included in that program section in order for the content to be clear and effective. For example, a "knowing that" objective can be achieved in a variety of ways:

- mini-lecture,
- Power Point type presentation (potentially with voiceover), short animated clip or video clip, and so on.

Specific content design choices reflect budget, available participant time, program delivery mode, and other considerations.

WCI content developers choose learning activities which best suit these considerations, as well as covering the potential range of participant learning styles and research on average learning retention rates.



Making such design choices is a **creative art**. With many years of professional development experience, as well as substantial experience with designing interactive computer applications that incorporate just-in-time help systems, WCI staff is well positioned to make these cost and time-effective professional development content design decisions

The following table summarizes some of our experience with such choices.

Type of Knowing	Kind of Content Required	Comparative Development Cost ($, time to develop)
"Know That"	1. Mini-lectures 2. Samples of effective behaviour (possibly animated or video) 3. Samples of ineffective behaviour (possibly animated or video) 4. Learning quizzes and games to test application 5. Explanations in response to “incorrect” answers to increase learning	1. Lowest 2. High if video, low to medium if animated 3. High if video, low to medium if animated 4. Low if using tool Quizmaker like Articulate Presenter or equivalent 5. Low if using tool like Quizmaker in Articulate Presenter or equivalent
"Know How To"	1. Problems to work through 2. Mini-cases to analyze 3. “Video-taped” typical simulations to response to 4. Practicums to apply know in “as close as possible” back on-the-job conditions 5. Feedback and coaching by “experts” during and after practice	1. Low if using tool like Articulate Presenter or equivalent 2. Low if using tool like Articulate Presenter or equivalent 3. High if video, low to medium if animated 4. High requires “experts” during development to increase realism 5. High requires trainers who both know area and are good “in the moment coaches”
"Know Why"	1. Inspirational talks or videos by creditable leaders 2. Facilitated case discussions with “creditable” peers 3. Dialogue with “creditable” mentors / coaches	1. High both video development and opportunity cost of leaders’ time 2. High requires expertise during development / delivery requires facilitators who both understand content and are good coaches 3. High – requires access to creditable mentors and coaches

Use and Development of Avatars To Increase Participant Engagement and Content Clarity

Engagement is often increased for all participants, not just those who learn by observing and reflecting, by including some form of avatar in the professional development program. Avatar development can add significant expense to content development. WCI uses the following framework to structure dialogue with clients about the costs and benefits of avatar development and inclusion in professional development programs. The options are presented in increasing complexity / effort of development and, therefore, cost.

Type of Avatar	Development Considerations	Cost ($ and Time) Considerations
Still stock photos with voice over	Easy to access – readily available on web – using head shots minimize background "fit" issues Requires script development for voice-overs	Photos for internal organizational use cheap (a few $ per photo) Voice-over actors and a reasonable sound recording environment can vary from "self done" to "professional" requires script recorded in sound studio➔ costs increase
Custom drawn "characters" with voiceovers	Increase background and "clothing", character fit to the organization ➔ likely to increase engagement and likelihood of transfer back to the job Requires script development for voice-overs	Voice-over actors and a reasonable sound recording environment can vary from "self done" to "professional" requires script recorded in sound studio➔ costs increase
Custom photos with voice over	"Fit to job" in terms of clothing and background high ➔increases likelihood of engagement and transfer back to the job Requires script development for voice-	Photo shots take planning and time – cost relatively cheap especially on a "per delivery basis Voice-over actors and a reasonable sound recording environment

Type of Avatar	Development Considerations	Cost ($ and Time) Considerations
	overs	can vary from “self done” to “professional” requires script recorded in sound studio➔ costs increase
Animated video clips using Xtranormal Desktop Note: Moviestorm (www.moviestorm.co.uk) is available as an alternative production environment, but requires separate voice-over recording. Use of Moviestorm increases development time, because of its greater production complexity.	“Fit to job” less but still reasonable, characters and background are “stock” to software package ➔ cognitive effort by participant to relate back to the job Engagement increased as a result of “watching” high level cartoon characters interacting Requires some level of scripting / story boarding	Development time is 1 to 2 hours to finished minute of animated video clip for an experienced user if Xtranormal Desktop Typed Text to voice using computer-generated voices for voiceovers Separate recording of voice-overs is possible, but increases development time and cost
First Level Adobe Flash animation with voiceovers	Automated version of “custom drawn characters with voice-over” Requires script / story board – possibly developed in Xtranormal Desktop Requires Flash Development skills Depending on complexity of interaction of characters and their movement against backgrounds,	Because of the “drawing” work required, development times are in the range of days per finished minute Requires lip synched voice-over recording after video is finished

Type of Avatar	Development Considerations	Cost ($ and Time) Considerations
	development times can rapidly (and exponentially) increase Voice-overs must be added after animation is complete	
Video production of included video clips using actors	High level of fit to the job, since shooting can occur in work environments, using actors dressed in "work-relevant" clothing Full shooting scripts / storyboards required Storyboards could potentially be developed in Xtranormal Desktop	Requires scripts, actors and a video production / editing crew ➔ cost can range from $1000 to $5000+ per finished minute
Movie / TV Quality Animated Flash Video Clips with "almost realistic" characters and sets	High level of fit to the job, drawing of backgrounds, characters and interaction can reflect work place considerations Full shooting scripts / storyboards required Storyboards could potentially be developed in Xtranormal Desktop Depending on complexity of interaction of characters and their movement against backgrounds, development times can	Because of the extensive "drawing" work required, development times are significant, ranging from days to weeks per finished minute Requires lip-synched voice-over recording after video is finished.

Type of Avatar	Development Considerations	Cost ($ and Time) Considerations
	rapidly (and exponentially) increase Voice-overs must be added after animation is complete	

WCI works with Xtranormal Desktop, either as an avatar production tool version or a story board preparation. At this point in time it is a reasonable tool, which makes good tradeoffs between the cost of development / content effectiveness for back-to-the-job transfer. As this technology develops in the future, WCI will make use of it. In certain business situations, 3-D reality simulations such as those available through EON Reality's software and delivery platforms (see (http://www.eonreality.com/ for samples of what is available at the high end.)

WCI can work with its partners to create whatever level of avatar / video content is required by a client. However, significant development time, cost, and complexity can be added as the client chooses more advanced types of avatars and video content. "Trial runs" with representative samples of participants, especially if the intended audience is large, are required to finalize the final version of avatar / video content.

Our approach to professional development content containing avatar / video development is outlined below.

6. Develop a minute-to-minute outline (equivalent to a story board) of the professional development program. Indicate places where avatars / video content will be used. Clarify the specific learning objective for each avatar / video clip.

7. Review with client. Finalize sufficiently for content development to begin.

Depending on the client / length of program / complexity of content, the following steps may be done in overlapping phases.

8. Do content development. Include placeholders for avatars / video clips.

9. Review content with client. Finalize sufficiently for avatar / video clip development to begin.

10. Develop avatars / video content.

11. Integrate avatars / video clips into professional development content. Review with clients.

12. Finalize both professional development content and avatars.

Often, the process cycles back through the content / avatar / video clip development steps, as the client decides on revisions to each. Each revision adds cost / time to the development process. If these revisions include changes / additions to the scope of the original learning objective for the professional development program, this process can become quite difficult.

13. Field trial program.

14. Make a list of required changes. Develop a cost estimate for making them. Meet with client to decide on final revisions, making appropriate cost / development time / effectiveness tradeoffs.

Maximizing the Ability of Participant to Control the Pace of Delivery and Movement through the Material

Professional development can be delivered just-in-time and at any place where a participant has access to a capable computing device. At the same time, “buttons” and “branching” can be built into the content, so that a participant can completely control the pace and flow through of the content.

WCI standard professional development content design work includes the following practices.

1. A learning switchboard which participants can use to move directly to any section in the program by “clicking” appropriate buttons.
2. “Go to Next” and “Go to Previous” buttons on each screen.

In addition, programs developed in Articulate Presenter Suite 2009, which are delivered over the Web in a browser, include another whole level of user control. Each participant, therefore, has the capability to control these elements to suit personal need and conditions.

Maximizing the Relevance of the Material to Participant Back-on-the-Job Situations

When designing professional development content for a specific client, WCI advocates the use of the organization’s day-to-day work language and visual references in the program material. There is a need for greater client input and review during the content development process to ensure that this occurs. This can increase content development costs. However, the results justify the investment, especially when considered on a cost-per-delivery basis.

Participants exposed to such material have less of a “cognitive task” in order to make the program content relevant to their on-the-job situation. As a result, likelihood of transfer back-to-the-job increases.

Use of Cost-Effective Professional Development Content Development Tools

WCI uses proven, cost-effective, content development tools that have wide acceptance in our content development work for clients and for ourselves.

Articulate’s Presenter Suite 2009 is one of the premier professional development rapid development tools. WCI uses it because it speeds up our process of content development. Running on top of Microsoft PowerPoint, it allows individuals to start from an existing skill base, and add specific professional development relevant abilities to their skill set. It has integrated voice-over management, video embedding capability, Quizmaker, Engage, and Video Encoder tools.

WCI also uses Quark Express (http://www.quark.com/Products/QuarkXPress) and Microsoft Office 2007 for the development of more traditional print and e-book professional development material.

2012 is expected to be a year in which three major professional development tools vendors:

- Articulate (www.articulate.com),
- Travantis – suppliers of Lectora Inspire (www.trivantis.com),
- and Adobe – suppliers of the Adobe-Professional development Tool Suite – which includes Captivate (http://success.adobe.com/en/na/sem/products/1105_2800_elearning.html?sdid=ISTBB&skwcid=TC|1026688|eLearning%20suite%202.5||S|b|11962773862),

are expected to make major announcements in the professional development content development tool space.

WCI actively follows these vendors, and through our participation in the Professional development Guild (http://www.elearningguild.com/) monitor the reaction of the professional development content development community to such tools.

Maximizing Professional development Professional Development Program Delivery to Participants

In the case of an professional development program, program delivery is largely a function of the delivery technology employed to make the program available to each participant. WCI's current professional development content development tool – Articulate Presenter Suite 2009 - can generate SCORM-compliant content that can be delivered to program participants in any one of the following ways.

1. Over an Learning Management System (LMS) that follows SCORM standards that runs on an internal WAN / LAN.

2. Over the Internet from a server to any microcomputer or other computing device that will run the last generation or so of Internet browsers.

3. On a CD or DVD that will run in a microcomputer equipped with:

    - appropriate CD/ DVD devices,
    - a mother board that is less than 5 years old,
    - either an on-board motherboard graphics capability, or an independent graphics card, capable of driving a colour monitor of at least 800 by 600 resolution.