

## THE EFFICIENT LEARNING PROCESS

Learning Activity	Explanation	Practical learning activities
<b>Attention</b>	Focus attention on the instructional information that is relevant for the <b>learning goal</b> . Define the learning objectives at the outset to facilitate attention (and avoid split attention or distraction). Discipline is essential to select and use only relevant information so avoiding clogging up working memory with extraneous material.	<ul style="list-style-type: none"> <li>- Focus and concentrate by reading or listening with questions in mind.</li> <li>- Clarify learning objectives</li> <li>- Discipline to avoid extraneous cognitive load. <b>Don't think about irrelevant things</b>; stay focused.</li> </ul>
<b>Activation of prior knowledge</b>	<p>New information must be integrated into <i>pre-existing schemas</i> that exist in long-term memory. This process of integration takes place in working memory. Therefore those schemas must be transferred to working memory from long-term memory. This transfer is called <i>activation of relevant pre-existing knowledge</i>.</p> <p>“Learners construct meaning out of their prior understanding. Any new learning must, in some fashion, connect with what learners already know...learners construct their sense of the world by applying their old understanding to new experiences and ideas.” Schulman, L. “<i>Taking Learning Seriously</i>” <i>Change</i>, Vol. 31, No.4 quoted in Guidelines on Learning that inform Teaching at MIT. (Teaching &amp; Learning Laboratory.)</p> <p>“Effective teaching supports positive transfer by actively identifying the relevant knowledge and strengths that students bring to a learning situation and building on them.” Bransford, J. et al <i>How People Learn: Brain, Mind, Experience and School</i>.</p> <p>“If I had to reduce all of educational psychology to just one principle I would say this: the most important single factor influencing learning is <b>what the learner already knows.</b>” Ansubel, D. et al <i>Educational Psychology: A Cognitive View</i>, p163 (1978)</p>	<ul style="list-style-type: none"> <li>- Write down what you already know about the topic</li> <li>- Explain how you think what you already know can help you understand the new learning. Be specific. Think about the learning objectives.</li> <li>- Begin to make links (matching, comparing and contrasting) with the new learning: concepts, theories, applications, principles, objectives of learning.</li> </ul> <p><b>Examples: more concrete.</b></p> <ul style="list-style-type: none"> <li>- How does the Conceptual Framework help you understand IFRS?</li> <li>- How do the objectives and principles of the conceptual framework help you determine materiality?</li> <li>- What are the principles of corporate reporting and how are they different from the principles of financial reporting? <a href="#">Refer to P2 terms and techniques</a>. What are the learning and practice implications of the differences.</li> </ul>
<b>Elaboration-rehearsal</b>	<p>At this stage of the learning process working memory must process new knowledge and skills in order to <i>integrate</i> them into the <b>activated schemas</b> from long-term memory. This processing is called <i>elaboration of information</i>.</p> <p><b>Elaboration</b> of information results from <i>rehearsal</i> of new content in working memory. It is more than a straightforward rehearsal: it involves matching, linking, adding, pruning, reconciling,</p> <p>A <b>self-explanation</b> is a detailed explanation of a worked example that the learner produces and from which he may discern a schema, principles, concepts, analogies and other devices that helps him develop in-depth understanding of the subject matter. (Illumination: comes from saturation, incubation, penetration, verification)</p> <p><b>Two types of self-explainers:</b></p> <p><b>Anticipative reasoners</b></p> <ul style="list-style-type: none"> <li>- anticipate the next steps in a solution process and</li> <li>- check the accuracy of their predictions, correcting as necessary</li> </ul> <p><b>Principled explainers</b></p>	<p>Build new schemas or rebuild old ones (<i>extension</i>)</p> <p>Always relate new knowledge to higher order concepts</p> <p>Relate to intellectual levels</p> <p>Monitor understanding (p228 EIL)</p> <p>Verify new information</p> <p>Identify conflict between new and old knowledge</p> <p>Seek new information if needed to check understanding</p> <p>Make sense of new knowledge</p> <p>Make analogies to advance understanding</p> <p>Mentally rehearse new schemas; detect and correct gaps in understanding.</p> <p><b>Methods for achieving the above</b></p> <p>Study worked examples (with repeated <i>self-explanations</i> p226-228 EIL)</p> <p>Do completion examples (<i>backwards faded</i>)</p> <p>Transition from <b>completion examples</b> to <b>practise assignments</b>.</p> <p>Objective questions with explanations e.g. <i>Edexcel</i></p> <p>Read and consolidate knowledge e.g. journal articles</p>

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	<ul style="list-style-type: none"> <li>- Identify the <b>fundamental meaning</b> of the example by understanding its conceptual foundation, <b>analysing</b> its <b>goal structure</b> into sub-goals and articulating the relationships between them</li> <li>- Sub-goals are analysed to identify the <i>principles</i> and <i>concepts</i> <u>inherent</u> in their “structure” and “content”.</li> <li>- Articulate the <i>relationships</i> between the sub-goals.</li> <li>- Make inferences</li> <li>- Consider implications</li> </ul> <p><b>Self- explanations</b> are beneficial in many respects including</p> <ul style="list-style-type: none"> <li>- developing communication abilities</li> <li>- discernment of underlying principles, concepts, theories, etc</li> <li>- developing ordinary and technical vocabulary (active use of the dictionary)</li> <li>- developing reasoning skills so often omitted from the learning process</li> <li>- developing analytical, evaluation synthesis and other competences</li> </ul> <p>These benefits can accrue to the learner if he commits to <b>regular deep processing</b> of worked examples with annotations and commentaries (orientation to deep structure).</p> <p><b>Action</b></p> <ul style="list-style-type: none"> <li>- Give examples of <b>deep processing of worked examples</b> involving <b>corporate reporting</b></li> <li>- Give examples of <b>annotated articles abstracting the relevant ideas &amp; principles</b> while demonstrating the relevant competences.</li> </ul> <p>This process can be elaborate, frustrating and time consuming. <b>But this is where and how deep learning takes place.</b> Process deeply for best results: clear insights, integrated knowledge, instant recall, effective retrieval, versatile application. Be patient.</p>	<p><b>Types of understanding</b></p> <ul style="list-style-type: none"> <li>- <b>Procedural understanding</b> (how does it work?). E.g. how does the cash flow statement work? How is it prepared? How does IFRS 13 concept of highest and best use apply to property (investment or otherwise).</li> <li>- <b>Causal understanding</b> (inferring: cause and effect). In a rights issue a “<i>deemed disposal</i>” occurs where the parent loses control in a subsidiary due to the dilution effect of additional shares taken up by other investors.</li> <li>- <b>Conceptual understanding</b> (discern or abstract concepts from example data and text; relate concepts to other concepts e.g. power, control, ownership, investee, associate, significant influence, options, rights to variable returns all related to consolidation)</li> <li>- <b>Ethical understanding</b> (what is best for everyone in the long run). This is <i>reasoning</i> based on values about what is “right” or “wrong”. These values can be professional (professional ethics) or business (business ethics). For example, the value of integrity is crucial to the professional ethics of an auditor because of the user’s reliance on the opinion of the auditor which is the product of the audit process. Offering an opinion that is without integrity is wrong and renders the auditor useless. Offering an opinion that is deficient because of incompetence (resulting in material misstatements not being detected) is also wrong.</li> <li>- <b>Connected (holistic) understanding:</b> (bringing it all together) discern links between different understandings and combine insights to form coherent new interpretations.</li> <li>- <b>Strategic understanding</b> (part of connected understanding but applied in very specific ways)</li> </ul> <p><u>Levels of understanding</u> (How to read corporate reporting texts effectively)</p> <ul style="list-style-type: none"> <li>- Literal</li> <li>- Interpretive</li> <li>- Applied</li> </ul>
<p><b>Encoding</b></p>	<p><b>As a result of elaboration and rehearsal</b> new knowledge, information and skills from the instructional environment are transformed into expanded schemas stored in long-term memory. This is known as <b>encoding</b> new knowledge and skills in long-term memory.</p>	<p>Recite Practise assignments Distributed practise (<i>extended period</i>) Reactive revision Proactive revision (<i>multiple encoding</i>)</p>

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<p><b>Retrieval</b></p>	<p><b>Retrieve new schemas to working memory.</b> This is triggered by a need to solve problems or to explain and answer questions e.g. in an exam. Unless stored schemas are retrieved learning cannot be said to have been effective.</p> <p><b>Retrieval is the basis for transfer.</b> It is selective and depends on the input as well as the quality of the storage. <i>Efficient retrieval comes with practice.</i> It makes for <i>versatile application</i> and is a hallmark of effective learning.</p> <p>Smart thinking depends on smart retrieval which in effect is matching the stored knowledge and skills to the question or task as speedily as is reasonably possible.</p> <p>Retrieval is recognition and recall. <b>Recognition</b> is matching stimulus to stored information. <b>Retrieval</b> is using sensory cues to search, find and assemble purposefully.</p> <p>The tutor should design instructional strategies that help the student to <u>purposefully</u> and <u>flexibly</u> (deliberate practice) consolidate the new learning in long-term memory. <i>Do an illustrative guide of how and where new knowledge should be consolidated in long-term working memory. Use a core topic such as <b>conceptual framework</b> or ethics. Use a past question that was poorly answered; refer to examiners commentary.</i></p> <p>Instructional strategies include:</p> <p><b>INPUT &amp; PROCESS STRATEGIES</b></p> <ul style="list-style-type: none"> <li>- Chunking (think in wholes, mental models, integrated learning)</li> <li>- Identifying critical attributes (<i>e.g. the use of critical attributes in the evaluation of the factors applicable to the fair value process; evaluation of what should be disclosed in accordance with the fair value hierarchy</i>)</li> <li>- Concept mapping (linkages encourage identification of related schemas)</li> <li>- Wide reading and consolidation (strengthens and extends <b>cerebral networks</b> that are constructed to contain the memory). Consolidation is the key not the reading or memory because it determines how well the information may be subsequently retrieved and used.</li> </ul> <p><b>OUTPUT STRATEGIES</b></p> <ul style="list-style-type: none"> <li>- Self explanations</li> <li>- Testing reasoning skills</li> <li>- Case studies <b>build connected thinking</b> and test completeness of schemas</li> </ul>	<p>Learning should include aiding retrieval by embedding cues with stored schemas of knowledge and skills. This requires advanced metacognitive skills, imagination about how the schemas may be applied and insight into learning objectives. <i>This is one area students would need a lot of help. Specify the help required and relate to the student tasks with examples. Discuss this in Retrieval Aid Section of Workbook or Study Book.</i></p> <p>Practice should aim to improve efficient retrieval. What type of cues aid efficient retrieval? <b>See WSSK</b></p> <ul style="list-style-type: none"> <li>- Context cues for specific applications e.g. classification, measurement and presentation of financial instruments</li> <li>- Concept cues</li> <li>- Structural cues</li> <li>- Process cues</li> <li>- Logic cues</li> </ul> <p>Transform stored facts into <b>useable knowledge</b> as expertise increases.</p> <p>How does frequent retrieval help <b>efficiency in learning</b> and exam preparation?</p> <p>Retrieval</p> <ul style="list-style-type: none"> <li>- reconstructs memory and re-learning</li> <li>- keeps open pathways to stored schemas</li> <li>- re-builds schemas</li> </ul> <p>When retrieval is combined with meta-cognition, experience and organising skills to answer specific questions it leads to</p> <ul style="list-style-type: none"> <li>- <i>indexing</i> of knowledge that enhances flexibility in application</li> <li>- <i>multiple linking</i> of knowledge to produce multiple schemas that facilitate transfer</li> </ul>
<p><b>Application</b></p>	<p>Whatever has been learned needs to be applied before one can be certain that it has been learnt correctly. Therefore apply knowledge as soon as possible after learning.</p> <p><b>Application involves</b></p> <ul style="list-style-type: none"> <li>- Consolidation (combine knowledge from various sources)</li> <li>- Explaining issues, problems, principles, theories, etc fully with examples</li> </ul>	<p><b>Near transfer</b> (apply knowledge to similar examples)</p> <ul style="list-style-type: none"> <li>- Repeat worked examples with self- explanations</li> <li>- Attempt completion examples with backwards fading</li> <li>- Attempt completion examples with forward fading</li> </ul> <p><b>Far transfer</b> (apply knowledge to remote situations)</p>

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	<ul style="list-style-type: none"> <li>- Solving complex problems (involving multitasking)</li> <li>- Drawing analogies</li> <li>- Writing notes creatively from your head e.g. making concept maps out of texts, making a tabular analysis of various aspects of performance management</li> <li>- Meta-cognitively reviewing what has been learnt in order to understand how it has been learnt. <b>Potential benefits:</b> i) transfer learning skills to other learning challenges; ii) understand learning problems e.g. I don't focus on developing automaticity in sub-skills; iii) I don't realize that every learning task or problem consists of sub-parts requiring sub-skills which must be separately learned, automated and integrated to form a <b>coherent schema</b>.</li> </ul> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>- Writing an essay consists of writing an introduction, developing the ideas and writing a conclusion. These parts have distinctive features that must be learned separately.</li> <li>- Dealing with transactions requires separate attention to: i) recognition (materiality, unit of account, unit of valuation); ii) measurement; iii) presentation, iv) disclosure;</li> </ul>	<ul style="list-style-type: none"> <li>- Attempt completion examples</li> <li>- Attempt assignments (past questions)</li> </ul> <p><b>Meta-cognition:</b></p> <ul style="list-style-type: none"> <li>- Improvement in learning: what have I learned? Does it meet the learning objective?</li> <li>- To what do I attribute the positives? I learned efficiently.</li> <li>- To what do I attribute the negatives? I failed to learn or I got there in the end, slowly.</li> <li>- Analyse sub-skills</li> <li>- Analyse learning and application requirements of sub-skills e.g. set up probability tables, set up payoff table, set up minimax payoff</li> <li>- Skills to automate</li> <li>- Skills to hone</li> <li>- How do I safeguard what I take from this practice session? Can I confidently transfer it to the next problem?</li> </ul>
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