

# Won Bronze, now aiming for Gold - Implementing a sustainable model for using information to learn at The University of Auckland.

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Much has been said and written about the importance of using information to learn (or information literacy). The gold medal achievement would be to have it seamlessly integrated into the curriculum across an academic programme at all levels. There are usually some institutional drivers, early adopters and keen participants. The challenge is to find a sustainable model, based on applied research, which could potentially provide a one size fits all solution to curriculum mapping. This presentation will present an information literacy instructional model that is based on one of the authors' recent PhD research. The model, as shown in Figure 1 below, was developed and continuously refined during the systematic integration of information literacy across the four year Engineering curriculum at The University of Auckland. The model was not a one hit wonder as proven by its subsequent successful application in the Nursing teaching programme. It is also currently informing the curricular integration of information literacy into the Planning programme in the School of Architecture and Planning, as well as in an Education programme in the Faculty of Education.

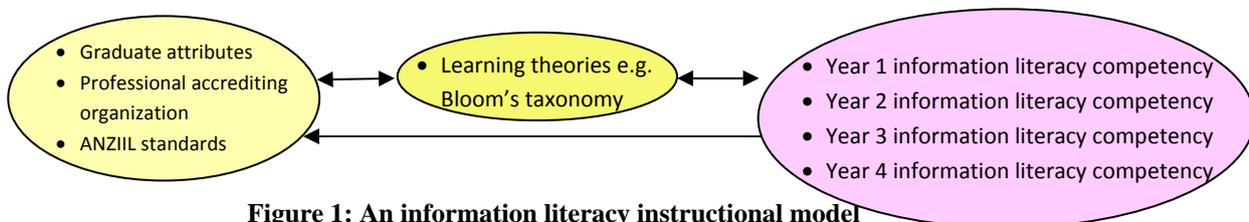


Figure 1: An information literacy instructional model

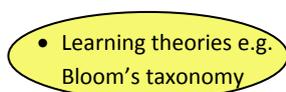
Deconstructing the model reveals its components and stakeholders as outlined below.



Potential employers expect to employ graduates who meet the job requirements and are able to use information to learn and develop. Information literacy is also a graduate requirement of many professional organisations such as the Institution of Professional Engineers New Zealand (IPENZ) and Engineers Australia (<http://www.engineersaustralia.org.au/>).

Institutional Teaching and Learning leaders and decision makers develop quality assurance policies and guidelines to steer the development of engaging learning environments and outcomes. Graduate attributes or profiles in higher education generally include discipline-specific body of knowledge competencies and generic competencies which might be common to most graduates such as information literacy, lifelong learning, critical thinking, problem solving and communication. To include the institutional graduate attributes in the model is in fact to apply the institutional curricular policy to the teaching curriculum.

A set of standards as developed by professional bodies such as Australian and New Zealand Institute for Information Literacy (ANZIL) and American Library Association (ALA) serve as a roadmap in defining learning outcomes and in developing learning activities and resources. Internationally recognised and used, it provides value and is a key component of the model.



Learning theories underpin learning design and tools used by academics, learning designers and learning support providers. Bloom' taxonomy identified six levels of cognitive development and provides the scaffolding knowledge and skills with which to build information literacy learning outcomes from a lower level to a higher level. The model demonstrates that Bloom's Taxonomy can be applied in curricular integration of information literacy to assist in developing information literacy learning outcomes, assessments and evaluation strategies.

The detailed information literacy instructional model as shown below presents how information literacy learning outcomes from a lower level to a higher level (in purple) can be developed based on Bloom's Taxonomy and be mapped to the University of Auckland Graduate Profiles, the IPENZ graduate requirements and ANZIIL information literacy standards. This model, although particularly suited to professional programmes, can be applied to all disciplines.

Graduate Attributes (GA)	Accrediting professional requirement (APR)	ANZIIL IL standards	Bloom's Taxonomy of Cognitive Processes	Examples of IL learning outcomes in Year 1	Examples of IL learning outcomes in Year 2	Examples of IL learning outcomes in Year 3	Examples of IL learning outcomes in Year 4
<p>III. A capacity for critical, conceptual and reflective thinking;</p> <p>II 4. Intellectual integrity, respect for truth and for the ethics of research and scholarly activity;</p> <p>II 5. An ability to recognise when information is needed and a capacity to locate, evaluate and use this information effectively;</p> <p>II 7. An ability to access, identify, organise and communicate knowledge effectively in both written and spoken English and/or Maori.</p>	<p>1.3 Synthesise and demonstrate the efficacy of solutions to part or all of complex engineering problems;</p> <p>1.4 Recognise when further information is needed and be able to find it by identifying, evaluating and drawing conclusions from all pertinent sources of information, and by designing and carrying out experiments;</p> <p>1.7 Communicate effectively, comprehending and writing effective reports and design documentation, summarising information, making effective oral presentations and giving and receiving clear oral instructions;</p> <p>1.8 Understand the role of engineers and their responsibility to society by demonstrating an understanding of the general responsibilities of a professional engineer.</p>	<p>1.1 Defines information need; 1.2 Understand the purpose and scope information sources; 1.3 re-evaluates the information need; 1.4 uses diverse sources of information. 2.1 selects the most appropriate methods or tools for finding information. 2.2 constructs effective search strategies. 2.3 obtains information using appropriate methods. 2.4 Keep up to date with information sources, IT and tools; 3.1 assesses the usefulness and relevance of the information; 3.2 defines and applies criteria for evaluating information; 3.3 reflects on the information seeking process and revises search strategies; 4.1 &amp; 4.2 Record and organise information 5.2 Communicates knowledge and new understandings; 6. Use information with understanding and acknowledge cultural, ethical, economic, legal, and social issues.</p>	<p><b>Knowledge</b> remembering or recognising something without necessarily understanding.</p>	<ul style="list-style-type: none"> <li>Know how to interpret references in course reading list or bibliographies.</li> </ul>	<ul style="list-style-type: none"> <li>Know how to cite resources in a preferred reference style and understand that different types of literature require different forms of citation.</li> </ul>	<ul style="list-style-type: none"> <li>Know when to give credit to information and ideas from others and how to cite resources using different reference styles.</li> </ul>	<ul style="list-style-type: none"> <li>Acknowledge cultural, ethical, and socioeconomic issues related to access to, and use of information.</li> </ul>
			<p><b>Comprehension</b> understanding the material being communicated.</p>	<ul style="list-style-type: none"> <li>Understand basic methods of obtaining information, e.g. keyword or author search.</li> </ul>	<ul style="list-style-type: none"> <li>Understand the difference between keyword and exact searching techniques (title, author, journal, subject).</li> </ul>	<ul style="list-style-type: none"> <li>Understand the differences between books, journals, conference papers, reports or patents.</li> </ul>	<ul style="list-style-type: none"> <li>develop a research proposal.</li> </ul>
			<p><b>Application</b> using general concept to solve a particular problem.</p>	<ul style="list-style-type: none"> <li>Construct basic search e.g. title and author search in library catalogue, database &amp; Internet.</li> </ul>	<ul style="list-style-type: none"> <li>Construct and implement effective keyword searches using appropriate synonyms.</li> </ul>	<ul style="list-style-type: none"> <li>Use the advanced search functions e.g. field search, set limits, and save searches.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct a literature review.</li> </ul>
			<p><b>Analysis</b> breaking something down into parts.</p>	<ul style="list-style-type: none"> <li>Sort search results by title, author, publication date etc.</li> </ul>	<ul style="list-style-type: none"> <li>Analyse the number and relevance of information retrieved and refine search strategy as required.</li> </ul>	<ul style="list-style-type: none"> <li>Critically assess number and relevance of information retrieved and refine search strategy as required.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise inaccuracies in information retrieved.</li> </ul>
			<p><b>Synthesis</b> creating something new by combining different ideas.</p>	<ul style="list-style-type: none"> <li>Write a short report or essay by summarising information obtained.</li> </ul>	<ul style="list-style-type: none"> <li>Summarize the main ideas from information obtained.</li> </ul>	<ul style="list-style-type: none"> <li>Recognises interrelationships between concepts and draws conclusions based on information gathered.</li> </ul>	<ul style="list-style-type: none"> <li>Compare 'knowledge gained' with prior knowledge to determine the value added.</li> </ul>
			<p><b>Evaluation</b> judging the value of materials or methods</p>	<ul style="list-style-type: none"> <li>Evaluate web resources by using basic evaluation criteria such as authority, currency, audience, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Analyse and evaluate information on its reliability, accuracy, authority and timeliness.</li> </ul>	<ul style="list-style-type: none"> <li>Distinguish facts, opinion, and bias of information retrieved.</li> </ul>	<ul style="list-style-type: none"> <li>Analyse and evaluate information by a variety of criteria such as reliability, validity, accuracy, authority, timeliness, and point of view or bias.</li> </ul>

**Bloom's Taxonomy - IL learning outcomes mapping**

Technologies particularly favoured and appreciated by the NetGen students at the University of Auckland were key building blocks in the curricular integration of information literacy. The online tools utilised include the Cecil learning management system, Referencite online referencing tool, Aropa online peer review system and Turnitin online academic plagiarism detecting system. The use of these tools will also be discussed in context of the curricular integration of information literacy. <http://creativecommons.org/licenses/by/4.0/>

