From; Mark Treadwell Educational Consultant.

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Response to the Draft Curriculum 2006

The draft curriculum is an excellent platform for the development of a final curriculum which will lead New Zealand educators and learners into the 21st century. The fundamental architecture based on a core vision, competencies, curriculum and values and principles is consistent with a researcher numerous reports released around the world dealing with "appropriate" education frameworks for the 21st century.

This is a draft and as such there is still work to be done. Having completed 25 sessions with schools throughout New Zealand we have identified a number of areas which require further work and discussion. During our work with educators it has become apparent that there is are four key areas that require attention:

1. **The suggested curriculum changes require a context:** Many teachers reading through the new curriculum do not identify the key strategic changes and if they do they regard them as mostly cosmetic. In working with each of the groups we spend the first hour of the day explaining the dramatic paradigm shift which is taking place within the education sector and how this is enabling school systems to develop powerful learning within their schools.
2. **A concept based curriculum.** The present curriculum "objectives" are inconsistent across each of the disciplines and I would suggest that these be rationalized into a consistent set of curriculum concepts which have a clear and precise pathway across each of the eight levels. The present objectives vary from concepts, to contexts, to content war the merging of any two or three of these elements. With the transition to a concept based curriculum it is important that the concepts which need to be learnt his clear and precise and hence it is imperative that a clear set of concept guidelines are available to educators.
3. **There is an inconsistency at present between the principles and values expressed in the document.** This area needs to be clarified so that educators and quite clear about the importance of principles and values and also the difference between the two.
4. **The competencies and their assessment need to be clarified.** The concept of competencies as described by the DeSeCo report needs some additional background and their assessment and their assessment of principles and values needs a greater depth of explanation as at present many staff were worth thinking that they would assess competencies based on traditional summative or qualitative processes.
5. **The present layout of the foldout curriculum areas makes it very difficult to track progress across the achievement levels.** This is a minor practical issue.

1. The requirement for a context

In order that the innovative changes within the curriculum are accepted across the broad range of stakeholders it is imperative that each of the groups involved understand why the curriculum has shifted from a context-content (achievement objectives) planning process to a conceptual (learning intentions) framework focus. In the workshops we have taken so far on the new curriculum we have spent the first

one hour establishing the rationale for why we need to shift from an end point of knowing about a particular context/discipline to an end point where the learner understands the conceptual frameworks which underpin a particular discipline and how these concepts may apply to a wide variety of different contexts. Jane Gilbert has written on this topic very well and I believe that the introduction to the curriculum needs to have within in it a brief "rationale" as to why these fundamental changes are being encouraged by the Ministry of Education.

The draft curriculum reflects this paradigm shift we have spoken on for some time now and is now evident on a global scale and this curriculum provides learners in New Zealand a tremendous advantage above their peers internationally in developing an essential conceptual framework which they can work through. **However, I am gravely concerned that without the necessary/appropriate professional development, schools will completely miss the point of this innovative curriculum.**

This curriculum change symbolises a quantum shift in the purpose of education and as a consequence the ability of schools to enable the intent of the draft curriculum requires a quantum shift in teaching pedagogy which takes place in the classroom at all levels. To generalize;

Primary schools: have begun this journey and many are now introducing inquiry based learning which underpins the quest to develop conceptual frameworks of understanding. Conceptual frameworks of understanding are a prerequisite in order for a learner to be innovative or creative; (this being the first rule of thinking). It is quite clear now that creativity, innovation, and ingenuity will underpin the emerging workplace of the 21st century just as the service sector replaced the dominance of the primary sector in the 20th century. If we wish to develop creative and innovative young learners then we must have a curriculum which focuses on the development of conceptual frameworks of understanding base on core knowledge bases, which is exactly what I believe the intent of this draft curriculum is. However, this is not obvious to many of those schools which we have visited and spoken to in the last three months. Once they grasp the purpose of the curriculum it opens up a totally different education pathway; a path that they are excited by and a journey which they believe will strategically benefit the learners in their learning community.

The AsTTle project is underpinned by this assumption is the framework of these diagnostic films embedded within the AsTTle is the SOLO taxonomy which identifies surface learning (knowledge) across a single concept, surface learning across multiple concepts, deep learning (understanding) across a single concept and deep learning across multiple concepts.

The SOLO taxonomy

	Surface	**Deep**
One Aspect	Uni-structural Assessment of this level is primarily quantitative.	Relational Assessment of this level is primarily qualitative.
Many Aspects	Multi-structural Assessment of this level is primarily quantitative.	Extended abstract Assessment of this level is primarily qualitative.

Secondary schools: are caught up in a conflict of philosophy between NZQA/NCEA and the learning intentions of the draft curriculum. The fundamental issue is the use of testing procedures that are based on the historical knowledge bases that have inhabited the minds of educators for centuries. Knowledge based curricula present a perfect education landscape for effective qualitative/summative assessment. To change to the conceptual framework approach it would be necessary to audit the present knowledge base at year 11-13 t establish the critical knowledge bases required to underpin the key concepts within each discipline. This is required in order to understand concepts and as a consequence learners would be able apply that understanding to numerous contexts. It takes far more time to teach for understanding than it does to simply remember knowledge for later recall, hence the requirement for a "knowledge audit" to describe the required critical knowledge in each of the disciplines. The possible review of NCEA(?) may tie in well with the implementation process (although this would require a move from the present implementation date for the draft to 2009) and would provide a seamless and consistent pathway for learners entering year 11 in 2010 (assuming we introduce the new curriculum at year 9 level in 2008.

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2. A "Concept-Based" Curriculum

The draft New Zealand curriculum is based on establishing a core level of competency and a core level of conceptual understanding across a traditional range of disciplines.

The draft New Zealand curriculum establishes a range of critical conceptual frameworks across each of the primary disciplines. Within the science curriculum, as an example there are a number of concepts identified across four discipline based contexts;

Nature of Science
Understanding about science
Students will learn about science as a knowledge system: the features of scientific knowledge, the processes by which it is developed, and the ways in which the work of scientists interacts with society.
Investigating in science
Students will carry out science investigations using a variety of approaches: classifying and identifying, pattern seeking, exploring, investigating models, fair testing, making things, or developing systems.
Communicating in science
Students will develop knowledge of the vocabulary, numeric and symbolic systems, and conventions of science, and use this knowledge to communicate about their own and others' ideas.
Participating and contributing
Students will bring a scientific perspective to actions and decisions as appropriate.

Physical World
- We can represent observed patterns via a range of formats.
- Forces can deform or cause a change in the motion of an object

Material World
- Atoms, molecules, and crystals combine in different ways.
- Grouping materials using their characteristics is helpful.
- The properties of a material dictate its use.

Living World
- Living things share common processes.
- Grouping living things with similar characteristics is helpful
- Living things are constantly changing.
- New Zealand living things are unique.

Planet Earth & Beyond
- Natural features are always changing.
- Using accurate observations helps us make sense of our universe.
- Many Earth processes are cyclical and are interdependent.

Once we have established the core concepts we wish to develop weekend enigmatic and their progress. The attached document contains a possible way forward here that encourages consistency by focusing on concept development. Please note that this was done very quickly and is only presented as an indicator not as what would be expected.

By creating a draft curriculum in this manner it fundamentally alters the way in which teachers are required to develop their "units of work" so that they will successfully meet the learning intentions as outlined in the document.

In the past, teachers would choose a context (usually one within which there are range of already existing resources in the library, on hard drives of computers, CDs, filing cabinets and in the teaches world of experience; such as dinosaurs, earthquakes, Aztecs . . .) and then attach a body of knowledge to the context which then had to be learnt by the learner. The end point for most of this learning was "knowing" the body of knowledge, not necessarily understanding it.

In the draft curriculum the emphasis has fundamentally shifted from knowing about dinosaurs to understanding the key concepts which underpinned the existence and the demise of dinosaurs. The key indicators are in no longer achievement objectives are but rather they are conceptual frameworks of understanding. In order to develop a unit of work based around a concept framework it is necessary to first of all grasp which concepts underpin that framework. Once these concepts have been identified the next critical step is to sequence these concepts appropriately, ensuring that each concept which is hoped to be grasped by the learner has already established beneath it the necessary "pre-concepts".

In working with a 25 groups are so far it is very apparent that teachers would struggle to develop their own conceptual map and require this to be done for them at a national level. Each of these concepts in the grid above contains contributing concepts.

For example a concept at level 3 in social science is:

"formal and informal groups make decisions that impact on communities"

In order for a level 3 learner to develop this conceptual understanding it has been assumed that they already understand the concept that *"people have a different roles, writes, and responsibilities as part of that anticipation in groups [level 2]"*. If the learner does not understand this concept and then they cannot proceed to understand the decision-making processes as outlined at level 3.

The difficulty we have found with the schools I have worked with over the last two months in regard to the new curriculum is that almost every teacher struggles to differentiate between concept, context, and content. Underpinning the concept

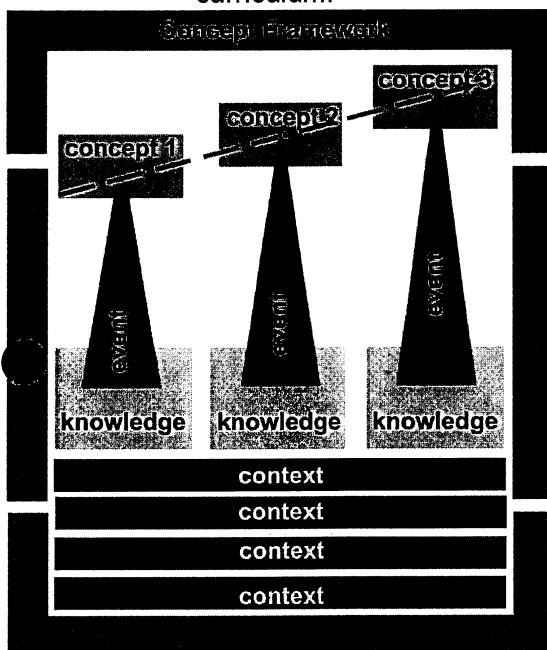*"formal and informal groups make decisions that impact on communities"*

is a range of "sub-concepts". In this case those "sub-concepts may be (I am not a social science expert!)

- Members of a group all contribute to the outcome of the group.
- Political and media processes can allow some groups to have more influence than others.
- Members of formal and informal groups are often elected or selected.
- Someone often has authority over managing a group and speaking on behalf of the group.

In order to understand the concept *"formal and informal groups make decisions that impact on communities"* it is necessary to first understand the four concepts above. These concepts cannot be taught in just any order as some of these concepts rely on other concepts first being understood. In order to for a learner to understand the overarching concept the necessary order of understanding would/could be:

- Members of formal and informal groups are often elected or selected.

- Members of a group all contribute to the outcome of the group.

- Someone often has authority over managing a group and speaking on the half of the group.

- Political and immediate processes can allow some groups to have more influence than others.

In finding that educators struggle to differentiate between concepts, content and the subsequent context, I believe that it will be necessary to set out for educators a conceptual framework that has more detail than is presently available. The example above displays the required understanding and in my experience of teacher groups over the last two months I am unconvinced that this understanding is sufficiently present in order for this part of the process to be successful. Lack of success will possibly drive schools to retreat to the context-content approach rather than the concept-content-context approach which is required in order that learner's develop an understanding of the overarching concepts which are identified in the draft curriculum.

Concept Framework

Concept 1 Concept 2 Concept 3

event event event

knowledge knowledge knowledge

context
context
context
context

Once the conceptual elements which underpin the conceptual framework have been established then it is a matter of attaching to each of these concepts a body of knowledge that needs to be understood prior to the concept being able to be understood. The last stage in developing a unit of work then becomes choosing a range of contexts. By introducing a range of contexts the learner begins to appreciate that concepts provide them where a gateway to building their own knowledge. **This is a fundamental cornerstone underpinning the desire of this curriculum to develop the capability for learners to build the capability to become lifelong learners.**

As a consequence of this we have fundamentally shifted the way in which educators develop units of work from context-content to concept-content-context. This shift in developing units of work is not obvious to most educators although it is implicitly implied throughout the curriculum. I believe quite strongly that this needs to be much more explicitly discussed within the curriculum document without turning the curriculum document it into an overwhelming volume of information.

In many of the curriculum statements educators were confused by the top level groupings such as technological practice, technological knowledge, and the nature of technology within the technology curriculum statements. The intent of these groupings needs to be clarified. I am presuming that the intent of these groupings is

to provide a balanced coverage of overarching concepts and that a balanced "coverage" is required.

In some cases the four groupings are not explicitly defined and these need to be articulated more clearly such as the Arts and Health and Physical Education. Some of these groupings are consistent across each curriculum level and others vary from one level to the next. Some consistency here, or a note explaining the changes across each level is required.

Using science as an example: From these key "framework concepts" underpinning the four contexts of "living world", "physical world", "material world" and "planet Earth and beyond" contexts have their own underlying concepts expounded. For sample in the "physical world" we can ensure coverage across the four different "framework concepts".

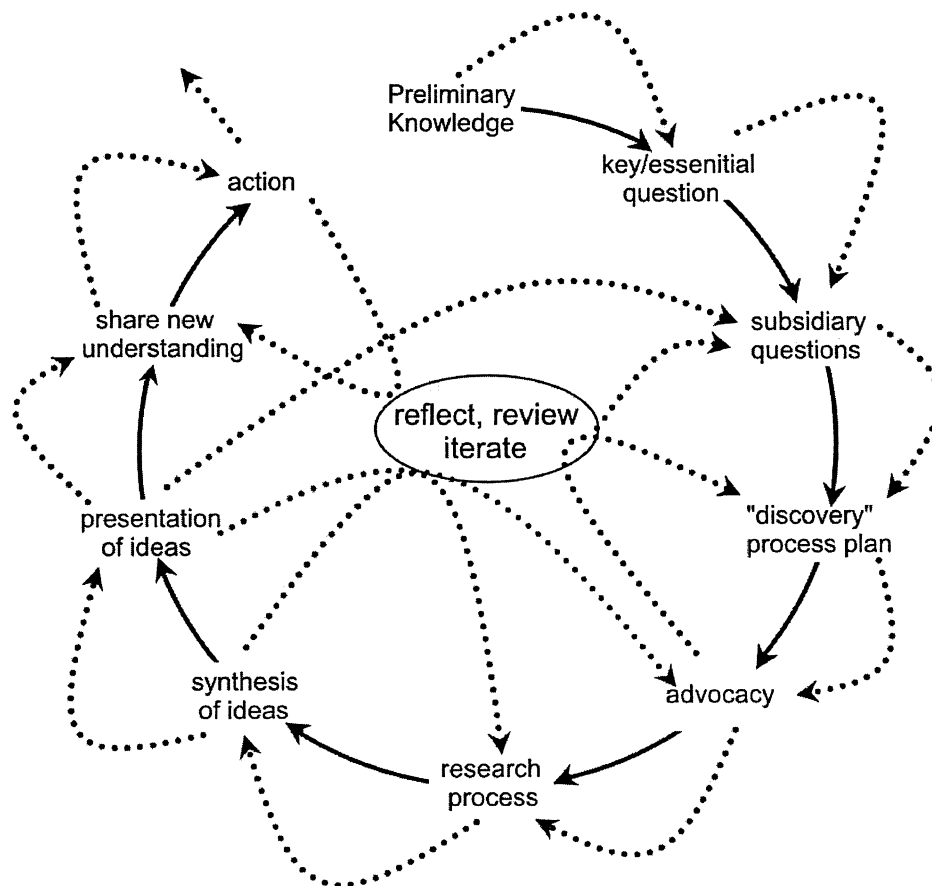| Level 4 Physical World	Understanding about science	Investigating in science	Communicating in science	Participating and contributing
We can represent observed patterns by a range of different formats	Understanding scientific ideas in a range of contexts identifying processes which scientists use to develop their understanding.	Investigating some scientific ideas, through effective questioning and exploring their own and others knowledge.	Communicating scientific ideas to different audiences using appropriate symbols, conventions and vocabulary.	Using inquiry methods to develop their own understanding, values and attitudes to current scientific issues.
Energy can be transferred or transformed into other types of energy.	Developing conceptual models and applying them to a range of contexts, appreciating the advantages and limitations of such models.	Investigate and record patterns and relationships between variables, using this to describe these relationships wouldn't.	Communicating relationships between variables using mathematical, scientific, written, visual and oral language tools.	Applying the predicted outcomes from relationships to everyday events, proposing possible outcomes, limitations and the degree of certainty.

Educators can then develop their own body of knowledge around each of the concepts and then select a range of different contexts which they can apply the body of knowledge to in order to construct a conceptual frame which they can then translate to additional contexts without learning a body of knowledge for every possible context they may encounter. This is a far more efficient way of learning and it is the very capability that has given us, as human beings, a strategic advantage over every other species on earth. We are the only species that has the capability for developing conceptual frameworks of understanding and applying those to unique contexts allowing us to successfully adapt to changing environments. This capability is based on the interaction between the neurons (10% of the brain cells in humans) and glial cells (90 percent of the brain cells in humans).

The process of writing a unit of work in terms of developing the concepts first and then developing content and finally identifying a range of contexts is quite different to the process of "teaching" the same unit of work. A unit of work may be introduced initially via a context, and then learners develop a sufficient knowledge base to begin exploring the concept and increase their own knowledge base. In order to develop the knowledge base into a concept they can understand, it is necessary to interrogate, manipulate and re-present the knowledge in a number of different media formats. This can be achieved through the inquiry learning process, hands on

experiments, interactive experiences, presentations (such as news reports, debates . . .), field trips, animations/DVD's, background reading, discourse . . . . . .

In our discussions with schools we have highlighted the fact that the inquiry learning process mirrors the process the people carrying out on a day-to-day basis and is very clearly aligned with the technology process, which underpins the Technology curriculum. This process is outlined below.

The Inquiry Learning Model

Preliminary Knowledge

key/essenitial question

action

share new understanding

subsidiary questions

reflect, review iterate

presentation of ideas

"discovery" process plan

synthesis of ideas

advocacy

research process

Critical to the development of the inquiry learning process is the realisation that the inquiry learning process is:

- a complex process and needs to be taught over a period of 10-13 years
- preceded by a base understanding of knowledge
- an iterative process
- needs to be broken down into modules to build competencies within each of the processes which underpin the process
- a complex process and in some instances learners will be provided with partially completed inquiries in order to focus on the last few stages

Presently inquiry learning is taught as a linear process and one which is unrealistically compressed into three of four weeks. That is a need for some professional development and resource support in this area.

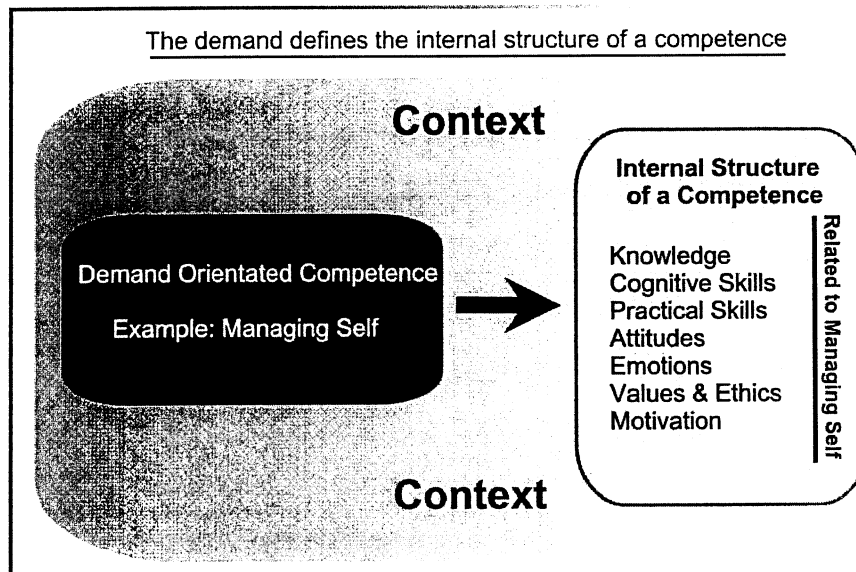## 3. There is an inconsistency at present between the principles and values expressed in the document.

I think I understand where the present principles and values have evolved from but in dealing with schools it is apparent that educators have very little philosophical knowledge in the area of attitudes, qualities, values and principles. Given that every item of knowledge is wrapped in each of these four sociological aspects and that once we teach young people to understand a given concept we also give them the power to be creative, innovative and ingenious in both good ways (Gandhi et all) and bad ways (9/11), it is important that we get to the values/principles correct.

Educators once again require a context for why they should be teaching values and principles and many educators have little concept of the emerging dramatic increase in creativity and innovation which we are seeing on a global scale across all disciplines. All knowledge is wrapped in attitudes, qualities, values, and principles and this knowledge underpins understanding which itself underpins creativity. If learners are not extrinsically taught a moral/ethical framework, they may emerge with a very limited moral/| framework within which to make decisions which may have far-reaching consequences. That requirement to encourage profound levels of learning and thinking is described in the thinking and learning architectural rubric we have developed below (based on an idea suggested by John West Burnham from Hull University).

	Surface (What?)	Deep (How?)	Profound (Why?)	Foolish (Why?)
Learning Processes	Memorisation	Reflective	Intuitive	Obtuse
Outcomes	Information	Understanding	Wise	Stupid
Thinking Processes	Eclectic	Sequential	Relational	Irrational
Evidence	Replication	Application	Creative	Unimaginative
World View	Self-centred	Empathetic	Compassionate	Dismissive
Motivation	Extrinsic	Intrinsic	Moral	Immoral
Attitude to Learning	Compliant	Engaged	Discerning	Indiscriminate
Learning Relationships	Dependent	Independent	Synergetic	Manipulative
Social Relationships	Self Centred	Considerate	Selfless	Selfish
Self Esteem	Self Aware	Confidence	Humility	Arrogance
Life [has]	Direction	Meaning	Purpose	[is] Futile
Concern for others	Pity	Sympathy	Compassion	Dismissive
Ethics	Attitudes	Values	Principled	Unethical

4. The competencies and their assessment needs to be clarified

The competencies derived from the DeSeCo report are well presented but many educators do not understand their significance. We have been using the diagram below (from the definition contained in the report) in order to show the makeup of the competencies and their interrelationship with the curriculum levels/concepts/knowledge.

The demand defines the internal structure of a competence

Context

Demand Orientated Competence

Example: Managing Self

Context

Internal Structure of a Competence

Knowledge
Cognitive Skills
Practical Skills
Attitudes
Emotions
Values & Ethics
Motivation

Related to Managing Self

What is also apparent is that educators have a limited language associated with competencies. For that reason we have developed a collection of rubrics associated with each competence that reflects surface, deep and profound levels across each competence. I had included the competency of "thinking" below as an example. This rubric requires further work and discussion. The remaining competency rubrics can be found online at http://www.i-learnt.com/Paradigm_Competencies.html

We have merged knowledge and practical skills, emotions and motivation, and attitudes values and ethics to make the rubric more manageable for educators. The rubrics originally were not designed to be assessment tools but rather a schema for a set of language, however we have trialed getting educators to profile learners and his rubrics turn out to be wonderfully democratic that even some of our "worst" learners achieving profound capabilities in a number of areas. The emphasis placed on these rubrics is awareness of what the capabilities may well be as a learner develops a particular competency.

Thinking	Initial	Deep	Profound
Knowledge & Practical Skills			
Questioning Focus	Recall	Analysis	Hypothesis
Research & Inquiry	Linear	Investigative	Insightful
Thinking Language	Competent	Articulate	Fluent
Logic & Argument	Refuting	Reasoned	Creative
Cognitive Skills			
Creativity	Resourceful	Imaginative	Ingenious
Perseverance/ Concentration	Diligent	Persistent	Resolute
Critical Thinking	Accepting	Investigative	Perceptive
Self Discipline	Organised	Self controlled	Scrupulous
Metacognition	Contemplative	Perceptive	Discerning
Logical Thinking	Commonsense	Deductive	Judicious
Attitudes, Values & Ethics			
Resilience/persistence	Stoic	Responsive	Perceptive
Outlook	Pragmatic	Hopeful	Optimistic
Reliability	Consistent	Dependable	Trustworthy
Dependability	Reliable	Trustworthy	Loyal
Emotions & Motivation			
Motivation	Extrinsic	Intrinsic	Moral
Commitment	Obligated	Enthusiastic	Passionate
Empathy	Aware	Considerate	Compassionate
Curiosity	Curious	Inspired	Awed
Creativity	Resourceful	Ingenious	Enterprising

It should be noted also that:

1. All knowledge is situational and is wrapped in attitudes, qualities and values (R. Hipkins et all)
2. Context is everything! All actions whether based on knowledge, thinking (cognitive skills); Attitudes, Values & Ethics; or Emotions and Motivations is totally dependent on the context. Inappropriate thinking and actions in one context may be appropriate in another and vice versa.
3. Thinking is central to all competencies (DeSeCo Eurudice http://www.eurydice.org/portal/page/portal/Eurydice)
4. Assessing all the competencies would be a nightmare. This is about monitoring progress of specific competencies and using a common language to describe the capability of the learner at a given point in time in regard to that competency area. Learners would reflect on their own competencies within their online electronic portfolios and subsequently feedback on them would be provided by educators, peers and parents/caregivers/whanau rather than having educators assess competencies during any particular unit of work (we're currently working on developing the capability for the SMS team).

In order to frame up the importance of the competencies and ensure that teaches understand that this is not just "business as usual", it is necessary to develop some

rubrics which describe the language associated with the competencies. The rubrics which we have developed are merely indicative and certainly require much more discussion and refinement. The rubrics are based on a concept developed by John West-Burnham at Hull University.

As mentioned earlier in the rubric headings of shallow, deep and profound are consistent with the work being developed within the AsTTle program based on the SOLO taxonomy (the MoE work we are presently doing on interoperability between student management systems and online learning environments is heading towards an integrated assessment package containing summative, diagnostic and formative assessments providing a comprehensive and manageable overview of student capability). The intention is not to assess each of the various elements within each of the rubrics but rather to build awareness of some of the indicators for success at each of the different levels of depth. It is critical for teachers to realise that shallow understanding is not a negative term but rather that this rubric approach indicates that shallow understanding precedes deep understanding which itself precedes profound understanding. The attached reading deals with this in more detail.

Using self reflective (metacognitive) assessment techniques, learners describe their own learning journey in each of the various disciplines or competencies and educators then use the learners' reflective work to provide a general profile of student capability in regard to the competencies. It is not the intention of these rubrics to provide educators with the list of elements which all need assessing and reporting on, far from it. The intention of any assessment program is to reduce the workload of educators and increase the quality of feedback to each of the stakeholders.

It is quite possible that the learner would be asked to reflect on (within the competency "relating to others") the status of their learning relationships or, with then the competency of "managing self" the status of their ability to logically approach problems. This of course requires an increased language capability associated with thinking and Metacognition. If young learners are encouraged to reflect on their own learning at an early age then it is a fairly simple process to simply continue this, gradually improving the quality of the learners' reflective writing as they progress through the schooling system.

In Summary

The conceptual framework of this curriculum is excellent and in all cases the responses from educators has been very positive. My fear is that most people reading this document without understanding the context would see this document as "business as usual" and this is far from the case. We have a unique opportunity here to develop this excellent framework into a curriculum which would lead the world into the 21st century. With the increase in information and communication resources now available to learners we are about to witness one of the greatest paradigm shifts ever, as educators finally have available to them the necessary teaching and learning resources, communication tools, assessment schemas, and effective pedagogies which would enable teaching for understanding, resulting in a vastly increased number of learners being able to be creative, innovative and ingenious. Being creative, innovative and ingenious not only fulfils deep personal aspirations but also underpins the growth in the creative economy which we will see dramatically increase over the next 40 years.