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What is Inquiry Learning?

Reference: Adapted from Focus on Inquiry (2003) Jeni Wilson and Lesley Wing Jan and Invitation and Inspirations (working title only) Moss et al. Curriculum Corporation, Victoria.

Learning, using the inquiry approach, can have many starting points and be implemented in many ways (see Murdoch, 1992, Murdoch & Wilson, 2004). It involves students forming their own questions about a topic and having time to explore the answers. The students are both problem posers and problem solvers within inquiry learning. Inquiry Learning encourages learners to examine the complexity of the world and form concepts and generalizations instead of being told simple answers to complex problems.

The inquiry approach to learning is based on the belief that students are powerful learners who must be actively engaged in the process of investigating, processing, organising, synthesising, refining and extending their knowledge within a topic. In other words this process is highly influenced by the theory of constructivism (see Bruner, 1986, Fosnot, 1996). In a nutshell, the inquiry process involves:

- planned, direct and vicarious experiences that provide opportunities for students to pose questions and gather information.
- activities that help students organise new information and use skills in a way that assist them to form concepts and generalizations about their world
- opportunities for students to demonstrate what they have learnt
- applying the knowledge, skills and values to other contexts.

Inquiry learning and integrated curriculum have recently been advocated by many middle years proponents as an effective ways to engage middle years learners. We believe there are many benefits of the inquiry approach to learning for learners of all ages. The inquiry process has the potential to develop skills and dispositions for lifelong learning, for example, independence, thinking skills, confidence, decision making, cooperative learning and other life skills. We can integrate different subject areas, information technology and global issues.

If implemented with the student as a central player in the decision making process, the pace, content and skill development can better match the needs of the learner. Because the approach makes learning relevant and purposeful, ownership and responsibility for the learning process is intrinsic. This can have an impact on both enjoyment and on-task behavior.

Challenges for Teachers Implementing Inquiry

Despite the many benefits of inquiry learning, this approach can be challenging. The inquiry approach requires the teacher to forfeit traditional transmission style teaching approaches. You must be able to facilitate student centred learning, develop student responsibility for learning and value student self-questioning. It requires a high level of organisation, flexibility and negotiation skills to challenge the range of learners in any classroom. For maximum effectiveness, on-going assessment is crucial. A challenge

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teachers often raise is that of resourcing the curriculum. However, **when 'people' are acknowledged as a valuable resource and with increased access to electronic resources, this issue becomes less of a problem.**

Common Characteristics of Inquiry

While there are different starting points for inquiries, for example, topical, global or community issue, interest or play based, inquiries generally have the following characteristics. They:
- are student centred and directed
- emphasise process and skill development
- require students to ask questions
- are conceptual based rather than factual
- usually involve some negotiation with students
- encourage learner interaction
- build upon prior knowledge
- utilise and consider students interests
- include direct experiences
- integrate reflection and metacognition
- involve the application of ideas
- explore affective aspects of learning
- raise different perspectives and tackle values

Sometimes the inquiry process is thought to be unstructured and unplanned. However the process is structured and useful for planning for effective learning. The inquiry approach is often used as the foundation for integrated curriculum planning but it can be used for individual subjects.

Inquiry: The process in a nutshell
- Problem or question
- Hypothesis
- Data collection and analysis
- Drawing conclusions
- Making generalisations and reflecting
- Authentic action

Adapted from http://ss.uno.edu//SS/TeachDevel/TeachMethods/InquiryMethod.html

Planning for Inquiry

There are many models for planning. The one below presents six basic (Wilson and Wing Jan, 2003). When planning for inquiry, the purposes of each stage provide guidelines for selecting appropriate activities. In practice, this is not a simple linear process. The distinction between some stages will be blurred and some stages may need repeating and many more experiences than originally planned. For example, more than one finding out activity may be necessary and this would need to be followed by more sorting out experiences.

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The planning is driven by the understandings sought and your knowledge of student understandings. We strongly believe that the content must be takes students beyond what they already know as well as developing worthwhile lifelong skills.

Table 1 Inquiry Stages and Purposes

Stage of Unit	*Purpose*	*Example Activities/experiences*
Tuning In Also known as: 1. Prior Knowledge **2.** Preparing to find out	To engage students in the topic To gauge student interest and attitudes To find out what students believe (understandings and misconceptions) To provide opportunities for students to share what they already know and believe To introduce/clarify language To identify gaps in their knowledge and misconceptions To assist with teacher planning of the unit	Posing questions Listing known experiences Picture chats Developing hypothesise and making predictions Planning research Visualisation Simulation games Using multi-media
Finding Out Also known as: • Direct experiences • Shared Experience	To take students beyond what they already know To challenge students' ideas, beliefs and values To enable the student to use skills (e.g. thinking, communication, cooperation, research skills) and knowledge to collect new information	Excursions Guest speakers Experiments Films Books Surveys Websites Performance
Sorting Out Also known as: • Processing the Shared Experience/s	To sort out, organise, represent and present information from the finding out stage of the unit. To provide opportunities for the students to use their preferred ways of learning to demonstrate their learning (knowledge, skills, values)	Creating and organising data, for eg, making graphs, Grouping, labelling Values clarification Computer simulations Construction Role play Artistic representations Video production
Going further Also known as: • Extending the Unit • Related activities/experiences	To extend/broaden the unit if appropriate To allow students to investigate areas of personal interest To use their preferred learning style To present another perspective on or dimension to the topic	Revisiting earlier questions Contract work Individual or group interest mini-research projects Learning centre tasks Exhibitions Community projects
Reflection Also known as: • Thinking about the Unit • Making connections • Drawing conclusions	To provide opportunities for the students to think about their learning –how they learnt what they learnt and why To identify changes in skills, knowledge and values To draw conclusions and make connections between ideas	Self, peer and group assessment Comparing tuning in ideas with current ideas Writing generalisations Journals (visual and written)
Action Also known as: • Taking Action	To identify what the students have learnt and the implications for personal actions To enable students to make choices and apply their ideas To relate their learning to real life situations	Publicising findings, eg, through newsletters Contacting relevant organisations Making a personal action plan Public performance

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In developing the parameters for inquiries, you need to consider the place of: the knowledge component (concepts and understandings), skills, values and thinking.

1. Concepts and Understandings

One prime goal of effective inquiry planning and implementation is that the students will develop significant understanding about the topic through meaningful teaching and learning experiences. Even if students play a major role in planning the inquiry, forming the understandings upon which a unit is based is the foundational part of the unit-planning process. It is the teacher's role need to identify the 'big ideas' or important broad knowledge about the topic that they wish the students to develop during the unit. (see Blythe, 1998). These are often expressed in statements called *Understandings*.

When learners develop understandings (or generalizations) about a topic, facts about the specific events, objects, people, phenomena need to be identified. Learners use higher level thinking and draw on these to form concepts. When students conceptualise (build concepts) they identify, organise and categorise groups of objects or events to make sense of the way the world works. Conceptualising assists people to generalise by grouping particular things together that have common characteristics. When we ask students to make generalisations about what they have learnt they usually relate to two or more concepts. See Marsh (2001) for further explanation of the relationship between facts, concepts, understandings and theory.

Some key concepts that may form the basis for planning challenging and significant units of work include:

Table 2 Example Key Concepts

Change & continuity	Technological advances
Needs & wants	Systems/Structures
Cooperation & Competition	Change & reaction
Power & control	Ecosystems
Interdependence	Adaptation
Relationships	Ecological Sustainability
Equity & access	Evolution
Decision making	Energy & Motion
Identity & Culture	Safety
Social organisation	Wellbeing
Diversity	Communication
Conservation	Resources
Life and living	

In the table below we have shown examples of understandings for the Key Learning Areas (or subjects) of Science, Studies of Society and Environment (SOSE) and Health.

Table 3 Examples of Broad Understandings and Key Concepts

Understandings

Health- The local environment and community services affect our safety and wellbeing

SOSE- Access to power and resources is not always equitable

Science- The structure of organisms is related to their function

2. Skills

There are many different types of skills that students need to employ when participating in the inquiry process. Regardless of the type of inquiry or year level, to be effective inquirers students need to develop the skills that will help them:

- identify what it is they want to know and do
- question and critically examine
- observe, predict and problem solve
- locate the appropriate sources of information
- gather, sort and organise the information
- synthesise and present the information in appropriate ways
- reflect on what they have learnt and the inquiry process
- think about ways of using their newly acquired information in other situations

They may also need skills related to specific subject areas. For example, in science students need to develop skills that enable them to design scientific procedures as well as specific skills to gather, measure, handle and interpret data. While some skills will be the same across all units across the school, the complexity of the task and the information being handled will determine the degree of difficulty of and therefore the level appropriateness.

3. Values and Attitudes

Recently there has been increasing emphasis on the place of values in education. Dealing with values is a complex and challenging part of the curriculum. While there is an enormous diversity of values, there are some that are inherent within a democratic society and these are taught and rewarded within classrooms.

One way that values have been classified is into these two groups:
1   Procedural values (modes of conduct or preferred practices/behaviors)
For example: obedient, polite, responsible
2. Substantive values (beliefs people hold about the way life should be lived)
For example: freedom, fairness, truth, cooperation, justice, equality,
(Adapted from Ministry of Education, 1987)

The values students hold and how and why values differ within and between groups of people can be explored during many of the inquiry units. Just as students' values may be explored during curriculum activities, you also need be aware that the values you hold can influence their selection of content, resources and delivery of curriculum. Students can be given the opportunity to explore theirs and others values through real-life examples appropriate to their developmental needs and abilities. This can be uncomfortable for teachers and students. Philosophy for children as been used to tease out values.

Students need opportunities to explore, explain and defend their own values as well examine, through guided learning experiences, how the values that people hold affect

their behaviour. The term attitude is often used interchangeably with values. However, although they are related they are different. An attitude may be indicated by a behaviour, for example a positive attitude may be expressed as open-mindedness, perseverance or independence.

Commonly Asked Questions

How much time should a unit take?
The duration of units is dependent upon the breadth and depth of content of the unit that you want to cover, the complexity of the knowledge and skills to be developed and the age, needs and interests of the students and time available. Some units can be effectively implemented during a 5 week time span (especially in the early years) while others may need much longer. Extended rich inquiries as the most effective.

Shouldn't I find out what students know before planning the unit?
Ideally the unit will be planned in its entirety after the results of the student's prior knowledge have been considered, but practically this is not always possible. The unit needs to be flexible and adaptable enough to adjust to the needs of the students and yet prescriptive enough so that you can cover the curriculum requirements associated with the topic. Some direct experiences may need to be booked ahead of time regardless of student prior knowledge. However, teachers usually make a reasonable estimate about the appropriateness and level of their students.

What is my role in the action stage of the unit?
Ideally students would chose and act on the findings from their own investigations but they may need your direction to help them do this. Students do not always know what options are available to them. It is the teacher's responsibility to provide guidance and support to broaden student ideas and to assist informed decisions about the suitability of each action. Authentic action is encouraged.

Why can't they just have fun?
Students learn better if they are interested in what they are learning, are provided with relevant and appropriate learning experiences and are challenged within a supportive learning environment. Planning a logically sequenced unit of work based on inquiry doesn't preclude the students having fun. The priority of any inquiry is on learning significant knowledge and skills through challenging, relevant and inclusive experiences rather than just creating fun activities that do not necessarily develop ideas and skills.

How can I implement inquiry units in my secondary classroom?
Secondary teachers frequently raise three questions about the implementation of inquiry. These refer to time constraints, covering required content and working with other teachers. In fact they are all related. These concerns also apply to primary settings but the approach may need to be slightly different.

In some schools, teachers of particular levels (mini schools), teach students for several periods a week - this is ideal for teachers collaborative planning and the development of deep ideas and student higher order thinking. If not, teaming with other teachers (sometimes from different subject areas) can help maintain a sense of continuity across the school day and unit. Many stages of an inquiry unit, for example, sorting

out data collected, ideally requires extended periods of time. Where double periods can be organised this should be sought.

Where timetabling does not allow significant periods of time and where teachers work in isolation, inquiry can still work but it will take longer and may be more frustrating for students and teachers alike. Some work can be included as part of the homework regime.

Inquiry should not be seen as working in opposition to covering significant, challenging content. This process should work in conjunction with the required curriculum content and be seen as useful (see benefits above).

Are projects the same as inquiry?

If projects do not require students to explicate their prior knowledge, gather new (preferably direct) information, organise ideas, draw conclusions and reflect on their gained ideas, the projects are probably not inquiry based. Ideally students would also feel motivated to take some sort of personal action. Teacher- designed projects may be but are not necessarily part of an inquiry unit. However, if they are to be used they should provide sufficient scope for students to negotiate (at least some of) the content and process as well as to cater for the range of abilities and interests within any class.

The least effective form of projects are those that simply ask students to regurgitate facts or to make choices related to their learning styles only. This can be enjoyable but students can waste a lot of time without ever exploring new and challenging content.

Unit Planning Tip List
The following list could be used as an audit of your planning process.

Preparation for planning
- **Select a topic** that will facilitate the exploration of significant content, will broaden the students' understanding of the world, cater for their interests and provide a balance of content across the year/s.

- **Collect and critically appraise a range of resources** (printed, visual, electronic and multi-modal)

- **Build up your knowledge** in the field

- **Collect units** to use as models and for sharing at staff planning sessions.

- **Plan in a team**

Planning
- **Form understandings** that reflect the significant knowledge

- **Link** teaching and learning experiences to understandings

- Consider **the range of perspectives** that students might investigate (if relevant)

- **Record** the sequence of teaching and learning experiences

- **Use strategy lists** so that there is a range to cater for learning styles and abilities.

- **Inform** the students of the intended topic to gauge interest and involve them in the planning of the unit (if appropriate).

- **Build on** what the students know and want to know –finetune planning if need be

- **Keep records** for reporting and future reference.

- **Plan for Assessment** that will enable all students to demonstrate what they know and can do.

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