Innovative Teachers

21ST CENTURY SKILLS

Critical Thinking

Note on the Authors

This document was developed through an international consultation process with educators and academics lead by Imagine Education (**http://www.imagineeducation.net**). The paper is deliberately discursive in its current format and works best when used in conjunction with the 21st Century classroom projects. It will be updated with example case studies to illustrate key points in the near future.

Introduction

At the heart of education in the 21st century is supporting critical thinking – a vital skillset in the information age. But what does it mean for teachers?

Critical thinking involves important skills such as reasoning, planning, critiquing and making judgements. These skills lie at the heart of being able to evaluate and understand sources of information and are central to learners constructing new ideas and knowledge. Developing as a critical thinker involves questioning and reflecting upon information based on its authenticity, accuracy and arguments. As digital technologies afford access to a growing amount of information and ideas, supporting young people to think critically is fundamental to their ability to make sense of, and participate in, the world around them.

There are numerous skills associated with thinking critically and many related practices can be found under the headings of reflexive practice, digital participation, learning to learn and thinking skills. Within each of these approaches, learners:

- Develop as independent learners
- Build strategies of inquiry, including formulating questions, planning and gathering information
- Evaluate sources of information for authenticity and accuracy
- Reason and defend their judgements, which may include skills such as making comparisons, highlighting patterns, applying deductive and inductive reasoning
- Look for trends and create hypotheses
- Reflect on arguments to draw conclusions based on merit

Teachers play an important role in supporting learners' critical thinking. Teachers who present themselves as learners open to inquiry model the roles and processes for learners to observe. Providing formative feedback and supporting learns to formulate new questions also supports learners in developing a critical approach. To support learners developing as critical thinkers, teachers:

- Encourage the active participation of learners
- Use a variety of questioning techniques, including using open questions
- Challenge learners' ideas and answers to foster reflection
- Provide access to a range of resources and space (including time) for open investigation
- Create an environment that supports risk taking

Role of digital technologies for assessment

The use of the internet for learning means access to a huge, and growing, amount of information and data. This presents a greater need to support learners in developing the skills to evaluate that information and the sources that they use to inform their work. There are a range of tools that can support this process by:

- providing structures and scaffolds for learners to evaluate information and to create argument
- supporting mind-mapping of arguments and information

Digital tools can also be used to represent information in a variety of ways. By reframing information, learners have the opportunity to interact with arguments and sources in deeper ways. Further, by using digital technologies, learners can access a wide set of resources to support them in developing ideas whilst interacting with present and non-present collaborators to foster reflection and questioning.

There are a range of tools and technologies to support learners in this area. Building on the list of skills above, examples of such tools are:

- Exploratree **http://www.exploratree.org.uk**

Exploratree provides thinking frames to support learners in developing all aspects of an enquiry process: from formulating questions, to planning research activities, to collating and comparing information sources.

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Role of digital technologies for assessment

- Evaluation lesson plans

There are a number of tools/resources to support students in evaluating information. For teachers, finding approaches shared by other teachers can be a useful place to find such resources. One such example can be found **http://www.teachingexpertise.com/e-bulletins/enquiry-tool-evaluating-information-3729**

- **http://www.trendhunter.com/** and
- **http://www.google.co.uk/trends**

Using the internet provides access to an incredibly wide range of information. Trendhunter and Google Trends are examples of tools that enable learners to look at a range of trends as part of discussions about changes and consistencies.

http://labs.digg.com/ is a further example that shows more immediate trends.

- Bubbl.us **http://bubbl.us/edit.php**

Bubbl.us is a free collaborative mind-mapping tool which can be used for learners to map out arguments, creating links to evidence and information. By reframing arguments in a visual mindmap, learners can reflect on the strengths of evidence to inform their conclusions.

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Scenarios

01 ENQUIRY PROJECTS

Using and reviewing structures for enquiry to critically engage with content

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Mr Hughes provides each group with different resources to help structure an enquiry project looking at sport in the local community. Each group has been instructed to use one template to complete a project and to reflect on how useful the structure is in supporting their enquiry. One group uses the TASC wheel, another the Enquiry Circle and a third group uses the Big 6 resources, each developing sets of questions and research approaches to investigate what sports are available in the local area. During the final plenary session the groups discuss which elements of the project were best supported and which were hardest, focusing on identifying what elements of each resource were most useful. As a whole class they use their knowledge of enquiry structures to create a shared thinking guide for use in their next enquiry project which each student can adapt to their own preference if needed.

KEY WORDS: enquiry, reflection, questioning, scaffolds

02 ONLINE PARTICIPATORY HOTSEATS

Developing the 'hotseat' approach for learners to interact with experts and to develop questioning skills.

As part of a discussion around democracy and politics, Mr Jevons has arranged for a local Councillor to be interviewed by two of his students and to be involved in an enhanced 'hotseat' activity. The two students travel to the council offices and set up the interview with a webcam showing the conversation to the students back in the classroom. The Councillor spends a few minutes explaining her job and then talks specifically about her plans for a local park. The learners in the classroom use a range of resources to check the Councillor's comments and then send questions to the interviewees via instant messenger. The two student interviewers ask the new questions to find more information before the students in the classroom set further questions and research the Councillor's answers. Prompted by the teacher, the students ask how they can be involved in planning the changes to the local park to which the Councillor suggests they put together a class project and send their ideas to her via email.

KEY WORDS: reflection, questioning, networked, experts, instant messenger

Scenarios

04 PEERING CRITICALITY

Using annotation tools to demonstrate understanding of learning objectives
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Dr Blaxter makes a five-minute movie for her class of 15 year olds that explains some basic principles of advertising as part of their media studies work. In her movie, Dr Blaxter presents the principles and then gives examples of how adverts aim to persuade, influence or present a message. Following this presentation, Dr Blaxter sets a task for each student to review two online video adverts and to use a video annotation tool to note the aims of the advert and which of the principles are used within the advert. After watching Dr Blaxter's presentation, the students watch a range of online adverts before critically evaluating them against Dr Blaxter's teaching materials.

KEY WORDS: critical, annotation, review, applying learning objectives

03 EVALUATING SOURCES

Providing learners with a range of resources to foster their evaluation of sources
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Following a class conversation the previous day about a news story about a car accident, Miss Watson creates a set of resources about the news story including online text, paper cuttings, video, images and her own hand-written article. Using collaborative mindmapping software, the groups of students review the different sources of information. Miss Watson then brings collates the mindmaps on a shared screen and students direct her to move descriptions around the board whilst highlighting the connections between the arguments. After twenty minutes, the class creates a list of the shared descriptions of the story and under each source, a list of descriptions that are only found in one or two sources. Miss Watson asks each student to write a sentence about each sources of information using words from a list she shows on the whiteboard including right, wrong, authoritative, selective, comprehensive and authorised.

KEY WORDS: evaluation, analysis, reflection, information management

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Scenarios

05 THE SCIENCE OF INVESTIGATING

Students asked to find evidence to support false arguments to prompt discussion about sources of information

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Mr Damer gives each group in his science class an envelope with a statement that declares an assertion. Mary's group has the statement that describes glass as a liquid, along with the instruction to find evidence online that supports the statement. The group spends an hour collating evidence that suggests that the statement is true, making notes of the sources they have used and the arguments made. Where the arguments become too technical, Mr Damer works with them to make sense of the language whilst leaving the group to discuss the arguments. After an hour, it is revealed that each group in the class has been paired with a group researching the counter point of the argument. The two 'opposing' groups present their findings and sources of evidence with Mr Damer facilitating the rest of the class in judging the strengths and weaknesses of the arguments and sources of information used.

KEY WORDS: argument, evidence, critical, evaluation

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Professional Development Activity Description

Activity 1

Here are a set of scenario descriptions that outline some possible practices that use digital technologies to support the development of new teaching and learning practices that focus on assessment.

They are not written as predictions nor recommendations, but as a starting point for discussions about how this teaching tool can best be fostered in your teaching practice. Follow the suggested activities that use these scenarios to encourage these conversations.

REFLECTING ON QUESTIONING

An important teaching role in developing learners' critical thinking is using various approaches to questioning. There are many online resources that can be found through search engines using terms such as 'questioning techniques', 'classroom questioning techniques' and 'open and closed questions in education'. A further important aspect of critical thinking is analysing sources of information – and this activity has been designed to combine these two aspects.

1. Use a search engine – perhaps one you haven't tried before such as **www.bing.com** and search for websites that offer resources to support the use of different question types.

2. Browse through the results and select five websites to review in more detail. It may be useful to select at least one site that is closely related to the subject(s) that you teach.

3. Look for a thinking guide (**www.exploratree.org.uk**)

or an analysis framework that supports your own evaluation of the website. Again, it is useful to select one that you might be able to use with your students.

4. Review the websites using the guide. Make a note of question techniques that you can use in your class from any of the sources that you found useful.

Professional Development Activity Description

Activity 2

CRITICALLY EVALUATING EDUCATION

This activity is designed to foster conversation about the aims of education. It is a simple activity to run but provides an opportunity to make explicit beliefs and aspirations for education. The activity is designed for a group of 4-8 people and aims to create a shared, critical understanding of the aims of education. The activity is called 'Diamond 9'.

You will need:
• 9 evenly sized cards
• A pen
• A flat surface/table

Before the activity can begin, write the following on each of the cards:
1. Foster young people's health and wellbeing;
2. Provide opportunities for every learner to be successful in school;
3. Ensure learners have the skills for adult life and further study;

4. Ensure young people have the skills to work;
5. Socialise young people into local, national and international communities;
6. To reduce crime levels;
7. Keeping parents happy (through both child care and nurture);
8. To create responsible citizens, and
9. Foster confidence and independence.

These cards describe some of the 'aims' of education. It is useful if there is discussion first about whether these are the appropriate descriptions. It is important that the nine cards reflect the aims of education as seen by the group, so alter the cards if necessary.

The aim of the activity is to create a diamond shape with the cards (one card on the top row, two on the second row, three on the third row, two cards on the fifth row and one card on the final sixth row).

The group should be given three instructions, prefaced with the acknowledgement that there is no 'right' answer.

1. The first is that all 9 cards must be put into a diamond formation (as shown in the diagram). The cards must be laid out to show which of the aims of education are most important to the group.
2. The group will need to feedback the both the main agreements and main disagreements, and the relationship between the cards. It is important that each group be able to justify the position and relationship of the cards.
3. The order of the cards must be agreed by the whole group.

The activity requires conversation about the aims of education and as such provides opportunity for discussion and consensus building. The relationships between the cards can be hierarchical or linked in other ways, which provides the opportunity for groups to describe their outcomes in a variety of ways.

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Further Resources

A range of resources are available to support this teaching tool, including teaching resources, advice and research literature.

http://www.unescobkk.org/?id=1751

http://www.metcenter.org

http://www.exploratree.org.uk

http://www.enquiringminds.org.uk

http://www.openingminds.org

http://www.musicalfutures.org/

http://www.thekjs.essex.sch.uk/yates/othersites.htm

http://www.big6.com/category/teaching/

http://www.tascwheel.com/

http://www.health.bcu.ac.uk/dpl/nursing/
Placement%20Support/Model%20of%20
Reflection.htm

http://www.twitcam.com

http://www.qik.com

http://www.ltscotland.org.uk/informationliteracy/
index.asp

http://www.bubbleply.com/default.aspx

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