Not letting the technological tail wag the educational dog: The case for a framework of skills
JCS 2019 | 29 November 2019

Dallas Willard

“Reality is what you have to deal with”.

“Success is dealing with reality”.

By Loren Kerns from USA (WillardDallas_MCC_Sept08_026) [CC BY 2.0], via Wikimedia Commons
...The old man was peering intently at the shelves. 'I'll have to admit that he's a very competent scholar.'

'Isn't he just a librarian?' Garion asked, 'somebody who looks after books?'

'That's where all the rest of scholarship starts, Garion. All the books in the world won't help you if they're just piled up in a heap.'

David Eddings, *King of the Murgos* (1989, pp. 89-90)
The Librarian?
Think globally, but act locally (Jacques Ellul)

• Head of Library at Oakham School since 2008
• Librarian since 2003 (professionally qualified in 2006)
• Previously teacher of Religious Studies & Philosophy
• National Committee of CILIP School Libraries Group
• Section Standing Committee for School Libraries of the International Federation of Library Associations and Institutions (IFLA)
• Fellow of the Royal Society of the Arts
Future-proofing students through inquiry

Darryl Toerien
Head of Library at Oakham School

Chris Foster
Head of Student Research at Oakham School

July 20 at 11:30 – 12:15

#WLSA2019
An epistemological crisis

You can't teach people everything they need to know. The best you can do is position them where they can find what they need to know when they need to know it.

Seymour Papert (1928 – 2016)
Professor Emeritus | MIT Media Lab

"Seymour Papert helped revolutionize at least three fields, from the study of how children make sense of the world, to the development of artificial intelligence, to the rich intersection of technology and learning."

President L. Rafael Reif, President, MIT

"Seymour Papert, the creator of Logo", image courtesy Wikiversity
A pedagogical response

In a world where knowledge is growing exponentially, the tools for acquiring and interpreting that knowledge must be at least as important as the actual knowledge itself.

David Deutsch (1953 – )
Visiting Professor of Physics and Founder Member of the Centre for Quantum Computation | Oxford University

"David Deutsch". Image courtesy Lulie Tanett.
But, “ain’t nobody got time for that”

Independent learning requires, amongst other things, "progressive and systematic preparation for and development of pupils in becoming independent learners within the curriculum" (2008, p. 9).
So, unintentional but practically unavoidable

The principal lesson that school teaches is the need to be taught.

Ivan Illich (1926 – 2002)
Philosopher and priest

Image courtesy UnwelcomeGuests.
Transition: culture clash or opportunity?

NetworkEd2011. Supporting undergraduates of the future: developing a new curriculum for information literacy. Dr Jane Secker (now Senior Lecturer in Educational Development, City University of London) & Dr Emma Coonan (now Information Skills Librarian, University of East Anglia).
Not ALIES, but ALIEU!

European Network for School Libraries and Information Literacy
Every system is perfectly designed to achieve the results it is getting – *Engineering adage*

- It seems that a new divide is opening up in the US, with the better-equipped students taking the prizes of better grades. At the lower end of the information skills spectrum, the research finds that intervention at university age is too late: these students have already developed an ingrained coping behaviour: they have learned to 'get by' with Google (p. 23).

- If a similar pattern obtains in the UK, the key point is that information skills have to be developed during formative school years and that remedial information literacy programmes at university level are likely to be ineffective (p. 24).
IB DP Extended Essay and Academic Honesty

What is the extended essay?

The extended essay is a required component of the International Baccalaureate® (IB) Diploma Programme (DP).

It is an independent, self-directed piece of research, finishing with a 4,000-word paper.

What is the significance of the extended essay?

The extended essay provides:

- A practical preparation for undergraduate research
- An opportunity for students to investigate a topic of special interest to them, which is also related to one of the student’s six DP subjects.

Through the research process for the extended essay, students develop skills in:

- Formulating an appropriate research question
- Engaging in a personal exploration of the topic
- Communicating ideas
- Developing an argument.

Participation in this process develops the capacity to analyze, synthesize and evaluate knowledge.

An extended essay can also be undertaken in a subject where students carry out an in-depth interdisciplinary study of an issue of contemporary global significance, across two IB diploma disciplines.

Academic honesty

Research practices when working on an extended essay must reflect the principles of academic honesty. The essay must provide the reader with precise sources of quotations, ideas and points of view through accurate citations, which may be in-text or footnotes, and full references listed in the bibliography; which, regardless of the system used, must ensure the minimum requirements.

Producing accurate references and a bibliography is a skill that students should be seeking to refine as part of the extended essay writing process. Documenting the research in this way is vital; it allows readers to evaluate the evidence for themselves, and it shows the student’s understanding of the importance of the sources used.

Failure to comply with this requirement will be viewed as academic misconduct and will, therefore, be treated as a potential breach of IB regulations.

For further information, see Academic honesty in the IB educational context and Effective citing and referencing.
A Framework of Information Literacy Skills?
### Citing and Referencing

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Understanding the Importance of Citing** | |}

### Example Citations

**APA Style**

*Author(s). (Year). Title of the work. Publisher.*

**MLA Style**

*Author(s). Title of the work. Publisher or Date.*

**Chicago Style**

*Author(s). *Title of the work*. Publisher, Date.*

### Referencing

- **In-Text Citation:** Include author and year in parentheses.
- **Works Cited/References Section:** List all sources alphabetically by last name.

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*Note: The above content is a simplified representation for educational purposes.*
<table>
<thead>
<tr>
<th>Task</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.h Critically examines and analyses relevant information from a variety of sources to discover relationships among ideas.</td>
<td></td>
</tr>
<tr>
<td>10.i Organizes notes and ideas using both print and electronic tools to create the most appropriate organizational pattern to express the connections and patterns.</td>
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<tr>
<td>10.4 Draws clear and appropriate conclusions supported by evidence and examples.</td>
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<tr>
<td>10.jDrafts the presentation/product to present an argument, point of view, interpretation, or new model most effectively with supporting evidence.</td>
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</tr>
<tr>
<td><strong>10.5 Cites all sources used according to standard style formats.</strong></td>
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</tr>
<tr>
<td>10.k Identifies and uses a variety of technology tools, including Web-based interactive tools, to organize information, create a product, and enhance communication with a real world application.</td>
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<tr>
<td>10.l Identifies and evaluates the important and subtle features for an effective product.</td>
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<tr>
<td>10.6 Records individual experience of the inquiry process – the hardest part, best part, skills learned, insights experienced, etc. – with suggestions for future improvements.</td>
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</tr>
<tr>
<td>11.g Categorizes information; adds necessary; explores connections and other related ideas.</td>
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</tr>
<tr>
<td>11.h Analyses different points of view to determine the best supported point of view by supporting evidence.</td>
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</tr>
<tr>
<td>11.4 Presents different perspectives, supporting evidence for each.</td>
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<tr>
<td>11.i Identifies and addresses previously held misconceptions.</td>
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</tr>
<tr>
<td>11.5 Chooses the most appropriate visual, textual, and language to communicate in real world formats to different audiences.</td>
<td></td>
</tr>
<tr>
<td>11.j Publishes final product for an audience and real world application.</td>
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<tr>
<td>11.k Assesses and revises own work throughout the inquiry and revision process.</td>
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</tr>
<tr>
<td>8.6 Draw conclusions based on implied information.</td>
<td>7.6 Interpret information and ideas by defining, classifying, and inferring.</td>
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<tr>
<td>--------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>8.g Compare information found to support a hypothesis; revisit and revise thesis as appropriate.</td>
<td>7.k Question the difference between sources and seek additional sources to resolve.</td>
</tr>
<tr>
<td>7.l Publish final product for a particular audience and purpose.</td>
<td><strong>7.7 Cite all sources used according to local style formats.</strong></td>
</tr>
<tr>
<td>8.7 Create products for authentic audiences.</td>
<td>8.h Use two or three strategies to evaluate a product based on self-assessment, teacher feedback.</td>
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<tr>
<td>7.8 Use established criteria or collaboration with classmates and teacher to develop criteria for assessment.</td>
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</tr>
<tr>
<td>Express</td>
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<td>---</td>
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</tr>
<tr>
<td>5.j Using writing process to develop expression of new understandings.</td>
<td>6.o Use pre-writing to discover alternative ideas and present conclusions.</td>
</tr>
<tr>
<td>5.8 <strong>Cite all sources used according to model provided by teacher [or librarian].</strong></td>
<td>6.p Draft the presentation/product with consideration of audience.</td>
</tr>
<tr>
<td>5.k Uses a variety of technology tools chosen by librarian or teacher to create products.</td>
<td>6.4 Present conclusions and support ideas using a variety of ways.</td>
</tr>
<tr>
<td>5.9 Modify and revise own work based on feedback from teachers and others.</td>
<td></td>
</tr>
<tr>
<td>5.l Checks for correctness and completeness.</td>
<td>6.q Assess own work and begin to take ownership of the revision process.</td>
</tr>
</tbody>
</table>

| Reflect |  
| --- | --- |
| 5.m Identify and evaluate the important features for a good product. |  |
| 5.10 Assess and revise own work with guidance. |  |
| 5.11 Identify own strengths and set goals for improvement. |  |
| 5.n Relies on feedback to figure out how to improve product and process. |  |
5.8 Cite all sources used according to model provided by teacher [or librarian].

7.7 Cite all sources used according to local style formats.

10.5 Cites all sources used according to standard style formats.
The ESIFC and FOSIL

- Developed in 2009 by school librarians in New York City under the auspices of the Office of Library Services and Director Barbara Stripling
- Endorsed in 2012 by the School Library System of New York State (SLSA) and renamed the Empire State Information Fluency Continuum (ESIFC)
- Re-imagined in 2019 under the leadership of Barbara Stripling
- Serves 3.2 million students in 4,236 schools in New York State alone
- Adopted as FOSIL in 2012
From Stripling’s Model of Inquiry to FOSIL

CONNECT
- Connect to self, previous knowledge
- Gain background and context
- Reflect on own learning
- Ask new questions
- Develop questions, make predictions, hypothesis
- Enter new understanding to context, new situation
- Express new ideas to share learning with others

REFLECT
- Reflect on own learning
- Ask new questions
- Develop questions, make predictions, hypothesis
- Enter new understanding to context, new situation
- Express new ideas to share learning with others

WONDER
- Wonder what else you might already know to better understand what you do not yet know
- Identifying those questions that will best guide your investigation
- Knowing what skills and resources are available to you
- Being able to use them effectively

INVESTIGATE
- Building an accurate understanding based on factual evidence
- Expressing conclusions about questions and hypotheses
- Think about information to illuminate new questions and hypotheses
- Making the most compelling case given your evidence and audience

EXPRESS
- Connect to self, previous knowledge
- Gain background and context
- Reflect on own learning
- Ask new questions
- Develop questions, make predictions, hypothesis
- Enter new understanding to context, new situation
- Express new ideas to share learning with others

CONSTRUCT
- Connect to self, previous knowledge
- Gain background and context
- Reflect on own learning
- Ask new questions
- Develop questions, make predictions, hypothesis
- Enter new understanding to context, new situation
- Express new ideas to share learning with others

FOSIL
Learning by finding out for yourself

FOSIL Framework for Inquiry Learning: Develops students' understanding and thinking skills through the development of key questions (FOSIL = Connect, Reflect, Wonder, Investigate, Express, Construct)
Framework Of Skills for Inquiry Learning

F O S I L
Learning by finding out for yourself

CONNECT
Drawing on what you might already know in order to better understand what you do not yet know

REFLECT
Evaluating how you have worked and what you have produced

WONDER
Identifying those questions that will best guide your investigation

EXPRESS
Making the most compelling case given your evidence and audience

INVESTIGATE
Knowing what scholarly resources are available and being able to use them effectively

CONSTRUCT
Building an accurate understanding based on factual evidence

FOSIL (©) Framework Of Skills for Inquiry Learning
Developed at Oakham School from the United States-Canada Science and Technology Curricula (U.S.-Canada Science & Technology Curricula) and the United States-Canada Science and Technology Curricula (U.S.-Canada Science and Technology Curricula).
1.1 Inquiry skills: INVESTIGATE

- Different types of sources/organisation of information
- Navigation and search strategies
- Evaluation, selection, curation and use of multiple sources
- Evaluation and selection of evidence within sources
- Perspective/ point of view
- Strategies to make sense of information
- Capturing information and thinking/ note taking
The map is not the territory, but it certainly helps
IB DP EE and Kuhlthau’s ISP

<table>
<thead>
<tr>
<th>Year 1</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Spring 1</td>
<td>Jan</td>
<td>EE seminar</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>EE select subject and supervisor</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>EE select research question</td>
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<tr>
<td>5</td>
<td>Feb</td>
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<td>6</td>
<td></td>
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<tr>
<td>7</td>
<td>Easter</td>
<td></td>
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<tr>
<td>8</td>
<td></td>
<td>Complete form on your EE</td>
</tr>
<tr>
<td>9</td>
<td>Mar</td>
<td>Do research until EE week</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Easter</td>
<td></td>
</tr>
<tr>
<td>Summer 1 - 7</td>
<td>Apr</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>June - Easter</td>
<td>EE research week - timetable suspended</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>EE 1st draft in</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td>Summer</td>
<td>EE rewrite if required</td>
</tr>
<tr>
<td>Autumn 1</td>
<td>Sept</td>
<td>EE final draft in</td>
</tr>
</tbody>
</table>

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**Model of the Information Search Process**

<table>
<thead>
<tr>
<th>Initiation</th>
<th>Selection</th>
<th>Exploration</th>
<th>Formulation</th>
<th>Collection</th>
<th>Presentation</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uncertainty</td>
<td>Optimism</td>
<td>Confusion</td>
<td>Focus</td>
<td>Clarity</td>
<td>Sense of direction / Confidence</td>
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</tr>
</tbody>
</table>

**Feelings (Affective)**

**Thoughts (Cognitive)**

**Actions (Physical)**

- Seeking relevant information
- Exploring information
- Seeking pertinent information
- Documenting information

- Increased self-awareness
### IB DP EE, Kuhlthau's ISP and FOSIL

<table>
<thead>
<tr>
<th>Task</th>
<th>Task Initiation</th>
<th>Topic Selection</th>
<th>Topic Exploration</th>
<th>Focus Formulation</th>
<th>Resource Collection</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling (affective)</td>
<td>Uncertainty</td>
<td>Optimism</td>
<td>Confusion, Frustration, Doubt</td>
<td>Clarity</td>
<td>Direction and Confidence</td>
<td>Relief and Satisfaction, Disappointment</td>
</tr>
<tr>
<td>Thoughts (cognitive)</td>
<td>Vague</td>
<td>Focused</td>
<td></td>
<td></td>
<td></td>
<td>Increased Interest</td>
</tr>
<tr>
<td>Actions (physical)</td>
<td>Seeking relevant information</td>
<td>Exploring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE Timetable</td>
<td>EE Seminar</td>
<td>Agree on research topic with EE Supervisor</td>
<td>Reference interview with Library</td>
<td>Finalization of research question with EE Supervisor</td>
<td>Leading to EE Week</td>
<td>Following from EE Week</td>
</tr>
</tbody>
</table>

**Carol Kuhlthau’s Information Search Process Model in Relation to the Extended Essay**
The FOSIL Group (Est. 25 April 2019)

- 100 members on 2/8/2019
  - 53 Topics & 165 posts
  - 81 educational organizations or individuals
  - 64 librarians, 23 teachers (17 in leadership, of which 6 senior, of which 3 Heads), 2 lecturers, 11 other
  - 30 state, 52 independent, 4 public (university), 14 other
  - 3 primary, 25 primary & secondary, 63 secondary, 4 university, 5 other
  - 87 UK, 13 International
- 142 members on 21/11/2019
  - 74 Topics and 239 posts
A long obedience in the same direction

The classroom leads (or should lead) inevitably and essentially to the library (Beswick, 1967).

To centre education in the learning process, rather than in the teaching process, encourage initiative and independence on the part of the student, and bring the student to grips with original thought as expressed in books and other media (Sheehan, 1969).
Bibliography


• Toerien, Darryl ([dt@Oakham.rutland.sch.uk](mailto:dt@Oakham.rutland.sch.uk)) | The FOSIL Group ([www.fosil.org.uk](http://www.fosil.org.uk))