Inquiry-Based Learning

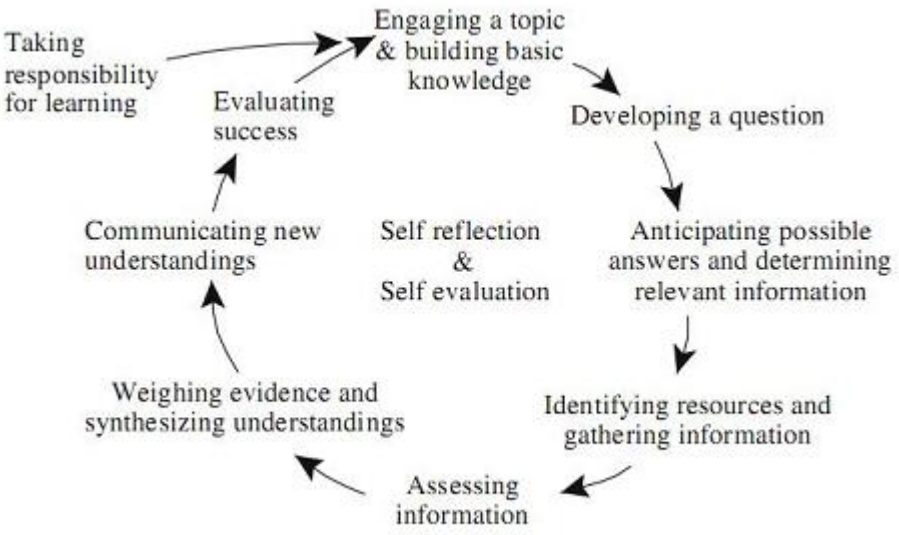
General

Inquiry-based learning (also *enquiry-based learning*, *inquiry learning* or *inquiry-guided learning*) is a constructivist instructional strategy widely adopted in the **1970s**[1] and based on John Dewey's views on learning as **active**, **learner-centered** process which should be based on **real-world examples** instead of rote fact memorization. Inquiry represents questioning which fosters curiosity and questioning by students. During the inquiry-based learning discovery is guided by learners through **forming questions** and **finding answers** to those questions alone or in teams.

What is inquiry-based learning?

The idea of inquiry-based learning is to foster characteristics of good learners and encourage them in the educational process. These characteristics[2] include confidence in the ability to learn, enjoying problem-solving, trusting one's own judgement, not fearing being wrong, a flexible point of view, and respect for facts. These qualities, according to Postman and Weingartner[3] can be fostered through an approach in which the teacher:

- rarely tells the students what they need to know since that would reduce their excitement in finding things out on their own,
- interacts with students mostly through questioning and encourages interaction among students,
- does not accept short answers, but rather tries to deepen them by further questioning,
- rarely summarizes what students' discussion and what they have learned since learning is a continuous process.



The **inquiry-based process of learning** can be described as a cycle based on these activities mainly through following main steps:

- **Questioning** and curiosity provoked through questioning by the teacher together with taking

the responsibility for their own learning by the students starts this process of learning.
- Investigation, gathering of information and **studying materials**, observing and other related activities are then expected to be performed by the students.
- This is followed by a **synthesis** of collected information, building hypotheses and possible explanations and planing on how to prove them.
- Development and presentation of **explanations**. **New questions** may arise at this point.
- Reflection on the original question, the research path, and the conclusions. Newly arisen questions form the beginning of a new cycle.

These steps in general are quite similar to the steps of problem-based learning. Differences between these two approaches are minimal according to some[4] and appear only in their origins (problem-based learning was developed in medical education and inquiry-based learning in science education), other suggest it is the role of the teacher:

- "*In an inquiry-based approach the tutor is both a facilitator of learning (encouraging/expecting higher-order thinking) and a provider of information. In a PBL approach... the tutor does not provide information related to the problem — that is the responsibility of the learners.*".[5]

Some authors suggest different inquiry-based learning modes depending on the level of scaffolding[6]:

- structured inquiry - when teacher presents a problem and main frames for addressing it,
- guided inquiry - when teacher provides questions to motivate students, but the research they do is self-directed, and
- open inquiry - when students formulate questions and investigate them themselves.

Advantages of inquiry-based learning are **increase in students motivation**, active approach to learning, academic skills and intellectual habits[7]. Students are also encouraged to develop of critical thinking, **reflect on their learning**, use different learning resources and gain **deeper understanding of the course concepts**.[8]

Various areas in which inquiry-based learning has been applied include ecology, endocrinology, political communication, engineering and sociology[9].

What is the practical meaning of inquiry-based learning?

An example of inquiry-based learning is learning about language using a Star-Trek episode as a motivator[10]. In the Star Trek: The Next Generation episode "Darmok" viewers are introduced to the concept of *Tamarian language* spoken by an alien civilization. Weather this invented language could be an actual human language was debated by many professional linguists. A possible instructional plan for learning about language characteristics based on this episode is the following:

- Show students the "Darmok" episode
- Pose the problem to them: could *Tamarian* be a human language?
- Provide students with resource materials or encourage them to look them up themselves.
- Assist them if necessary on how to research the question and conduct analysis of language properties.
- Analysis of results and reflection.

Criticisms

Keywords and most important names

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Example borrowed from: Lane, J. Inquiry-based Learning. Schreyer Institute for Teaching Excellence, Penn State. 15th September 2007.