HP13017 – Scientific thought
Teaching notes

Final evaluation:

The EXANI-II will be applied in the final evaluation. This test measures generic predictive competencies in the following areas: Mathematical thinking, Analytical thinking, Language structure, and Reading comprehension. Its purpose is to stablish the level of an individual's potential to achieve new learning.
EXANI-II is graded only by the correct answers obtained in the exam, and there is no penalty for unanswered questions. There are two scores for every student: a global score, and one that grades each area of the exam.
Scores published by CENEVAL are expressed in a special scale known as "Índice CENEVAL" (ICNE). The tests results are located in between 700 points (lowest score) and 1 300 (highest score).
For more information regarding EXANI-II, please visit the official site of CENEVAL at: http://www.ceneval.edu.mx/ceneval-web/content.do?page=1738

Make sure the students register at CENEVAL's platform. By registering they will be able to take the EXANI-II test. They must deliver the *Pase de Ingreso al Examen* as a proof of registration.

Topic 1

Learning notes **for in-person class:**

- Make sure to participate in the class discussion correcting false ideas of what is science and what is not.
- The student may confuse some pseudoscientific knowledge from the real scientific one: parapsychology, metaphysics in a not philosophical way, religious thoughts.
- Be sensitive on religious topics. Induce the discussion, but with tolerance and respect.

Learning notes **for online class**:

- Make sure to participate in the discussion forum correcting false ideas of what is science and what is not.
- The student may confuse some pseudoscientific knowledge from the real scientific one: parapsychology, metaphysics in a not philosophical way, religious thoughts.
- Be sensitive on religious topics. Induce the discussion, but with tolerance and respect.

Topic 2

Learning notes **for in-person class:**

- Make the students aware that there is not a unique “scientific method” but many different techniques and methodologies in order to find true scientific knowledge.
- Discuss the many tools used by scientists.
- Use interesting and current topics such as neuroscience, space discovery, global warming, and new archeological discoveries.

Learning notes **for online class:**

- Make the students aware that there is not a unique “scientific method” but many different techniques and methodologies in order to find true scientific knowledge.
- Discuss the many tools used by scientists.
- Use interesting and current topics such as neuroscience, space discovery, global warming, and new archeological discoveries.

Topic 3

Learning notes **for in-person class:**

- Use interesting and current topics such as neuroscience, space discovery, global warming, and new archeological discoveries.
- The scientific articles can be from magazines such as Popular Mechanics, National Geographic or similar.

Learning notes **for online class:**

- Use interesting and current topics such as neuroscience, space discovery, global warming, and new archeological discoveries.
- The scientific articles can be from magazines such as Popular Mechanics, National Geographic or similar.

Topic 4

Learning notes **for in-person class:**

- The importance in this class is to distinguish useful and useless information. Not everything that is written is important for the research project. The student has to identify the core of all articles and make an opinion out of them, rather than just copying a summary of parts of the information.

Learning notes **for online class:**

- The importance in this class is to distinguish useful and useless information. Not everything that is written is important for the research project. The student has to identify the core of all articles and make an opinion out of them, rather than just copying a summary of parts of the information.

Topic 5

Learning notes **for in-person class:**

- At this point the students must have a clear idea of the research project to be developed and a proposal of hypothesis.

Learning notes **for online class:**

- At this point the students must have a clear idea of the research project to be developed and a proposal of hypothesis.

Topic 6

Learning notes **for in-person class:**

- Make sure students understand differences between experimental and non-experimental research design types. Include as many examples as possible.

Learning notes **for online class**:

- Supervise the work done by students and give examples of every type of scientific research design found on the internet.

Topic 7

Learning notes **for in-person class:**

- Make sure students understand the sampling method application and that questions have to do with research variables. Practice interviewing in front of the class.

Learning notes **for online class:**

- Students have to choose a population and sample according to their environment. Review their research questions before going out to do the survey.

Topic 8

Learning notes **for in-person class:**

- Your students may have no previous statistics knowledge, so make sure to guide them through the process of codifying and drawing graphs.
- Moderate discussions as to find common codification criteria.

Learning notes **for online class:**

- Your students may have no previous statistics knowledge, so make sure to guide them through the process of codifying and drawing graphs.
- Moderate discussions as to find common codification criteria.

Topic 9

Learning notes **for in-person class:**

- Make sure the student identifies differences between research results, discussion and conclusions.

Learning notes **for online class:**

- Make sure the student identifies differences between research results, discussion and conclusions.

Topic 10

Learning notes **for in-person class:**

- The purpose of this topic is making students capable of reading and understanding scientific papers and getting them interested in scientific research.

Learning notes **for online class:**

- The purpose of this topic is making students capable of reading and understanding scientific papers and getting them interested in scientific research.

Topic 11

Learning notes **for in-person class:**

- Make sure students understand differences between experimental and non-experimental research design types. Include as many examples as possible.

Learning notes **for online class**:

- Supervise the work done by students and give examples of every type of scientific research design found on the internet.

Topic 12

Learning notes **for in-person class:**

- Make sure the student understands that science is connected with environmental problems and scientific data can support environmental causes.

Learning notes **for online class:**

- Make sure the student understands that science is connected with environmental problems and scientific data can support environmental causes.

Topic 13

Learning notes **for in-person class:**

- Make students interested in medical science and how they relate to it.

Learning notes **for online class:**

- Make students interested in medical science and how they relate to it.

Topic 14

Learning notes **for in-person class:**

- Students can relate this kind of science and technology advances with gadgets they daily use: internet, smartphones, smart televisions, laptops, tablets.

Learning notes **for online class:**

- Students can relate this kind of science and technology advances with gadgets they daily use: internet, smartphones, smart televisions, laptops, tablets.

Topic 15

Learning notes **for in-person class:**

- Make students interested in reading on recent astronomical discoveries

Learning notes **for online class:**

- Make students interested in reading on recent astronomical discoveries