



Tempus

CRITICAL THINKING

IMPRESS Project Soft Skills Team

Improving the Efficiency of Student Services

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Outcomes of critical thinking training

- 1) Give classical or your own definition of critical thinking, know its main components;
- 2) Critical reading, evaluating information and effective report writing;
- 3) Recognize techniques of verbal and written persuasion;
- 4) Know and recognize the main logical fallacies;
- 5) Make rational decision making with graphic organizers and visual means;
- 6) Correct interpretation of statistics;
- 7) Discuss and reflect different aspects of critical thinking abilities.

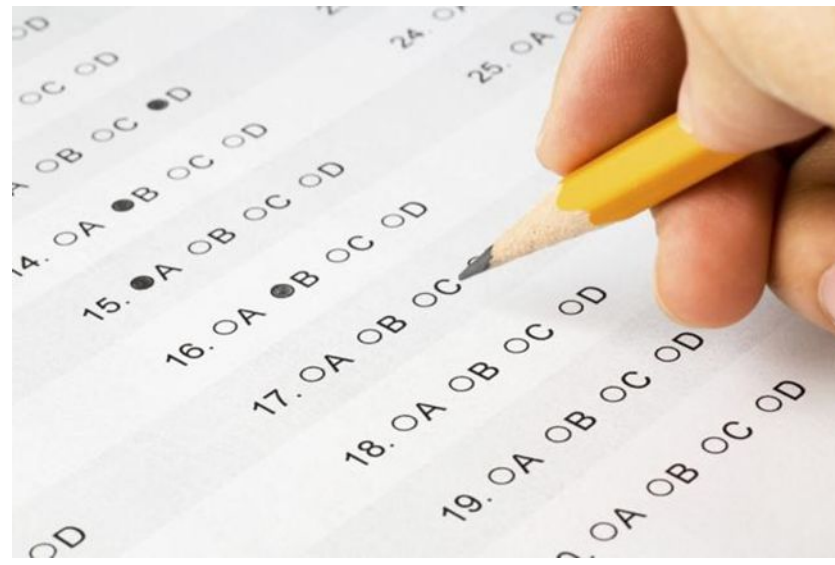
Definition

- The activity to think critically is a multidimensional capacity and basically encompasses cognitive, metacognitive and dispositional components. The cognitive components more often include such skills: to discover assumptions, to make inductive and deductive inferences, to evaluate information, to interpret causes, to predict effects, to formulate and test hypotheses, to make decisions and to define and solve problems. Critical thinking also includes creative skills to generate many varied and original ideas.
- The metacognitive components include consciousness, knowledge and regulation.
- The dispositional components include motivations, orientation to goals, attitudes.

(Sanz de Acedo Lizarraga, 2012)

Activity 1. Testing of critical thinking

- Pretest of Critical Thinking of L. Starkey
- To perform is given 25 minutes
- Scores calculation



Comparison of the features the ordinary and critical thinking (M. Lipman, 1988)

<i>Critical Thinking / Reasoning</i>	<i>Ordinary Thinking</i>
Estimating	Guessing
Evaluating	Preferring
Classifying	Grouping
Assuming	Believing
Inferring logically	Inferring
Grasping principles	Associating concepts
Hypothesizing	Supposing
Noting relationships among other relationships	Noting relationships
Making judgments with criteria	Making judgments without criteria

Critical reading and evaluation information

- Use the criteria: Who? Why? What? When?
- **Who?** Look at the qualification of the authors and sources of experience. Whether they are experts in their field? Whether they are published anywhere else? Are they sponsoring by someone or not? Were they cited by other specialists in their field? Is the publisher recognized and authoritative organization? Do they provide contact information?
- **Why?** Look at the purpose of the information. Whether the information is intended to inform, persuade, or entertainment? Is there sufficient evidence that there have been no complaints? Were the studies sponsored? This is objective or biased? Who is the target audience? Is it use emotional language?
- **What?** Look at the relevance of the information. Does it provide information at the appropriate level for your needs? Is this true in terms of geographic location? Is this an original or a secondary material? What this material is focused on? How limited is the coverage?
- **When?** Look at the novelty of information. Is the information up to date? Is there a publication date? When was it last updated? Are the links still active (the site)?

Recommendations for effective report writing

To write well-structured report it need to involve such writing abilities:

- Ability to draft an outline plan.
- Ability to formulate the head of report.
- Skills to write abstract if the report is long.
- Ability to set up the goal and the tasks of your report.
- Skills to structure materials and to design the plan of your report.
- Ability to formulate conclusions, to add necessary appendix.

Academic style of writing

The following characteristics are typical of academic writing:

- Use of correct grammar and punctuation;
- Uses cautious language;
- Avoids subjective and emotive language;
- Uses linking words and phrases;
- Uses correct referencing;
- Clear and concise language;
- Formal writing style.

Activity 2. Group reflection: the results of poor critical thinking

- As was found by H. A. Butler et al. (Butler et al., 2012) that high developed critical thinking predicts less quantity of negative life outcomes and vice versa.
- Group reflection – write on the board all possible practical consequences if people have weak critical thinking (the lectors prepared their own list and add their propositions in the time of pause of students' brain storm).
- The brain storming includes two phases – advance the propositions and theirs assessment.

The main elements of critical thinking

Understanding and use of oratory

Prediction and prevention of problems

Knowledge of the basic "logical fallacies"

Critical reading and writing style

Correct goal setting

Recognition of manipulating statistics

Recognition of manipulating in advertising and propaganda

Countering techniques of dishonest dispute

And many others...

Techniques of verbal and written persuasion

These techniques show the reader that the point of view of the author should act as their own point of view.

- 1. Rhetorical question: means that the answer is so obvious that other answer is not required .
 - **Example:** Can we expect that our teachers will maintain a high level of professionalism, if we do not pay them a fair wage?
- 2. The Rule of 'Three': based on the theory that people remember things when they are listed in three. The same idea can be told in 3 different ways.
 - **Example:** "Stop, look, and listen"; "Is your car old? rusting? ready to be replaced?"
- 3. Emotional language: it is using adjectives, so that the reader could feel a certain emotion.
 - **Example:** Management will not stop these cuts, and all of our children will go hungry. Then they close the plant and leave us without work and on the street.
- 4. Hyperbole: The use of exaggeration for extravagant effect; often used humor.
 - **Examples:** "A hundred years have not seen," "I've said it a thousand times."

Techniques of verbal and written persuasion (continuation)

- 5. Sound model: designed to attract the reader's attention and remember the contents better:
 - - Rhyme, - alliteration (repeated one the same sound at the beginning of words), the repetition of the same consonant sound, repetition of vowel sounds.
 - **Examples:** sweet smell of success; dime a dozen; “Don’t just book it—Thomas Cook it”.
- 6. Comparisons: show a relationship between two unlike items in one of three ways:
 - metaphor
 - **Examples of metaphor:** “golden hair”, “sunny smile” .
 - simile (uses “like” or “as”)
 - **Examples of simile:** the foreman is tough as nails.
 - personification (uses an animal compared to a non-animal)
 - **Examples of personification:** she eats like a pig; he’s an ostrich—he won’t face his problems.

Activity 8. Recognize rhetorical techniques



Texts

1. "In conclusion, let me say that voting for this candidate - is a vote for a perfect world".
2. She is smart, intelligent and successful.
3. She knows how to get things done. Other candidates want to take us back to a time when jobs are scarce, people were scared and the government intervened in the lives of people. Let's not let that happen.
4. Why turn the clock back, if we can move forward to a brighter future ?

Rhetorical techniques

Hyperbole _____

Rhetorical question _____

"The Rule of Three" _____

Emotional language _____

Logical Fallacies

False Dilemma

Post Hoc (after
this, therefore
because of this)

Hasty
generalization
(Jumping to
conclusion)

Unfinished claim
(it's better,
better... than?)

Circular
Reasoning

«Slippery Slope»

Equivocation

“Red herring”

Composition
fallacy

Logical Fallacies Examples

«**Slippery slope**». The argument might have two true premises, and a conclusion that takes them to an extreme.

Example: “We have to stop the tuition increase! Today, it’s \$5,000; tomorrow, they will be charging \$40,000 a semester!”

False dilemma - which presents in its major premise just two options (“either-or”) when in reality there are others.

Example: “Stop wasting my time in this store! Either decide you can afford the stereo, or go without music in your room!”

Logical Fallacies Examples (continuation)

- **Circular reasoning** - there is just one premise, and the conclusion simply restates it in a slightly different form. .
- **Example:** “I told you to clean your room!” “Why?” “Because I said so!”
- **Equivocation** - uses a word twice, each time implying a different meaning of that word, or uses one word that could mean at least two different things.
- **Example:** “Hot dogs are better than nothing. Nothing is better than steak. Therefore, hot dogs are better than steak.”
- **“Red herrings”** – are simply any unrelated topic that is brought into an argument to divert attention from the subject at hand
- **Example:** “Nuclear power is a necessity, even though it has the potential to be dangerous. You know what is really dangerous, though? Bathtubs. More people die in accidents in their bathtubs every year than you can imagine.”

Logical Fallacies Examples (continuation 2)

- **Post Hoc (after this, therefore because of this)** – occurs when an assumption is made that, because one event precedes another.
 - **Example:** I wanted to do well on the test, so I used my lucky pen. It worked again! I got an A.
- **Hasty generalization** – when premises do not contain enough evidence to draw a conclusion.
 - **Example:** That new police drama is a really well done show. All police dramas are great shows.
- **“Chicken and egg” fallacy** - an error by confusing cause and effect.
 - **Example:** Last night I had a fever. This morning, I have a cold and a fever. The fever caused the cold.
- **Composition fallacy** – by focusing on parts of a whole and drawing a conclusion based only on those parts.
 - **Example:** Every player on their team is excellent. So their team must be excellent, too.

The correct interpretation of statistics

Which answer (s) can be a valid conclusion for the following statistical analysis?

The researchers wanted to know, does the use of night-light in the rooms or the light in children's bedrooms to myopia. They conducted a study which showed that while 10% of children who did not use the lamp, have myopia, 34% of children who used the nightlight and 55% of those who slept with top light, too, have myopia.

- a. The myopia is arise because of the night-light and light in the room.
- b. Children with myopia greater use the nightlights than children with normal visual acuity.
- c. Nightlights will help you see better in the dark.
- d. Children with one or both parents with myopia, greater use of nightlights than children whose parents have normal visual acuity .

Responses

- There are two possible correct responses to this question.
- Second option (b) – it's the best explication of presented statistics.
- Nevertheless, the last response (d) is also acceptable, as there is evidence of the hereditary nature of myopia.



Activity 6. Recognition of statistics manipulation

■ Practical Exercise

- It need to divide in two groups for the use of statistics with different purposes
- **Situation: The researchers found that 98% of juvenile offenders who have committed serious crimes, regularly watch TV with scenes of violence.**

If you are a supporter of reducing violence on TV, how would you use these statistics?

What would you do if you were a supporter of freedom of speech on television?

Does critical thinking is equal to general abilities?

IQ

- verbal memory;
- figural memory;
- logical thinking;
- figural-visual knowledge;
- numerical knowledge;
- general knowledge etc.



Critical thinking

- Understanding and use of oratory;
- Prediction and prevention of problems;
- Knowledge of "logical fallacies";
- Critical reading and writing style;
- Recognition of manipulating statistics;
- Recognition of manipulating in advertising and propaganda;
- Techniques of dishonest dispute etc.

Activity 7. The distinction between facts and opinions

Mark each statement as (F) of fact or (O) opinion.

___ 1. World War II began on September 1, 1939.

___ 2. Cream Brylle - the most delicious dessert.

___ 3. I went to rest in the Carpathians in the past year.

___ 4. To invest in the stock market - a bad idea.



Activity 9. Dishonest dispute techniques

- Ad Hominem (“against the person”)
- Insult
- Extraneous circumstances
- Blame “And you yourself ...”
- Flattery
- Scare tactics
- Pity



Group Work: Give examples of encounters with such techniques from your experience

Example analysis for critical thinking developing

Example: “Sleeping problem”

Sleeping stage REM (rapid eye movement) returns periodically during sleep time, and someone sees vivid dreams. Theories about the causes of sleep vary widely, ranging from the theories of Freud, who believed the dream kind of spare valve to release psychic energy to assumptions that sleep plays an important role in information processing, and to representations that dream is simply the product of random neural activity of the brain. Although the causes of sleep are still not clear, sleeping is necessary without any doubts. After the periods when a person is deprived of REM sleep would follow longer REM-periods.

Imagine that your elderly aunt (client, patient, colleague) is concerned about his insomnia. She argues that she sleeps only 3-4 hours a night, in the morning feels restless, do not sees any dreams. Fearing that the loss of sleep and dreams create psychological problems, she tries to take a nap in the afternoon to "catch" it up, in the middle of the night she engages in aerobics to get tired and fall asleep faster, and even drinks a glass or two of alcohol. And although she claims that insomnia affects the health and mood, you do not notice any changes in it. Moreover, she is quite naturally and easily leads the conversation.

Activity 3. Writing essay as a homework + Group Discussion on next contact hour

In your essay answer the following questions about “Sleeping problem”
(example analysis):

1. Whether aunt's (client's, patient's, colleague's) concern about her sleep is justified? Should she worry about her insomnia?
2. Which actions should she take to improve her sleep?
3. Is it possible that aunt (client, patient, colleague) completely ceased to see the dreams? How can she become sure in this?
4. Suppose your aunt (client, patient, colleague) was right when she said that she had ceased to see the dreams. What could be the expected results of such a state in the light of Freud's theory? In the light of physiological psychology? Cognitive psychology?

During group discussion on next contact hour discuss your opinions from your essays .

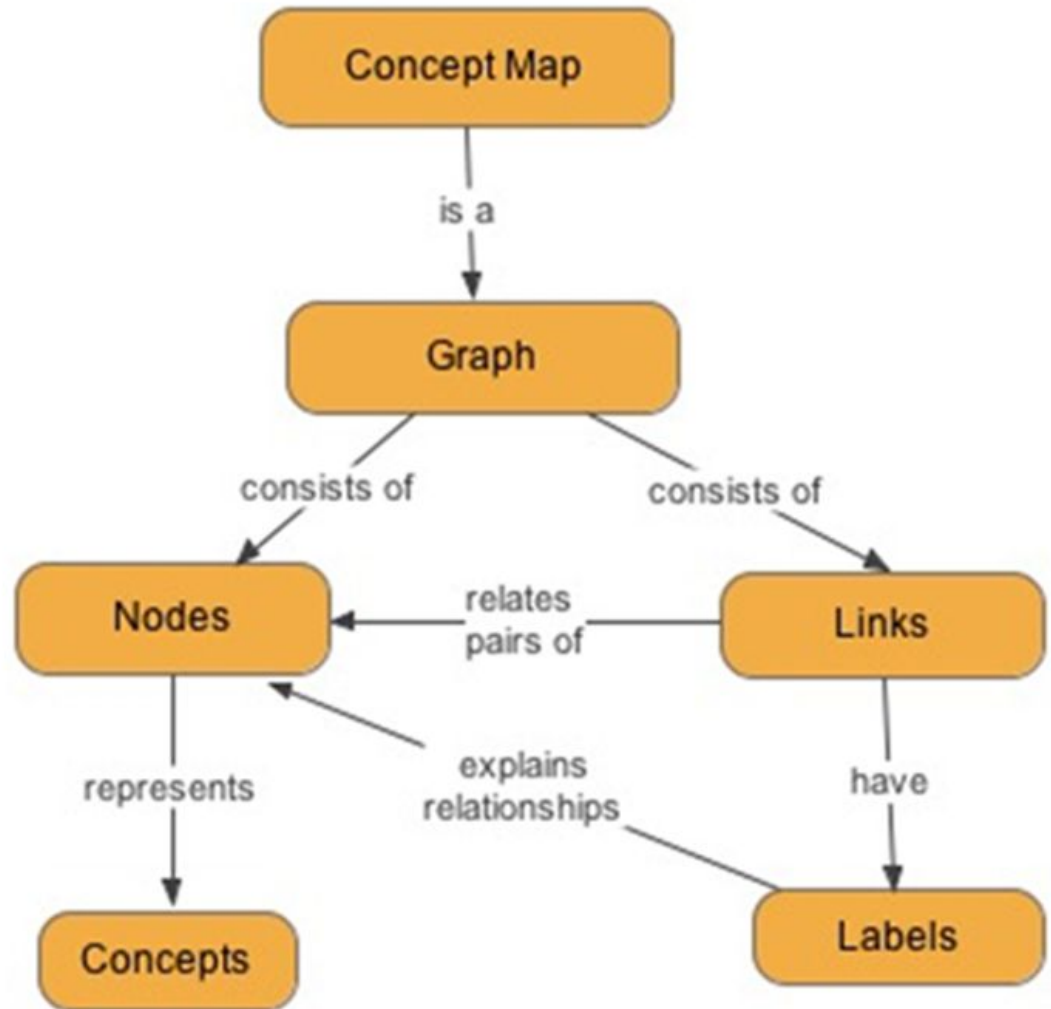
Graphical organization of information

Why graphic organizers of information are better than simple list?

- They are a meaningful display of complex information.
- They help you to see patterns and organization in your thinking.
- They help you gather and compress information.
- They keep you focused on your goal.
- They show what you know and what you still need to find out.
- They help you understand and interpret your thoughts and ideas.

Concept Maps

Concept maps, also called target maps, should be used when you are exploring a topic that is not complex. Concept map visually arranges a simple decision and the factors that may be used in making that decision (Starkey, 2004).



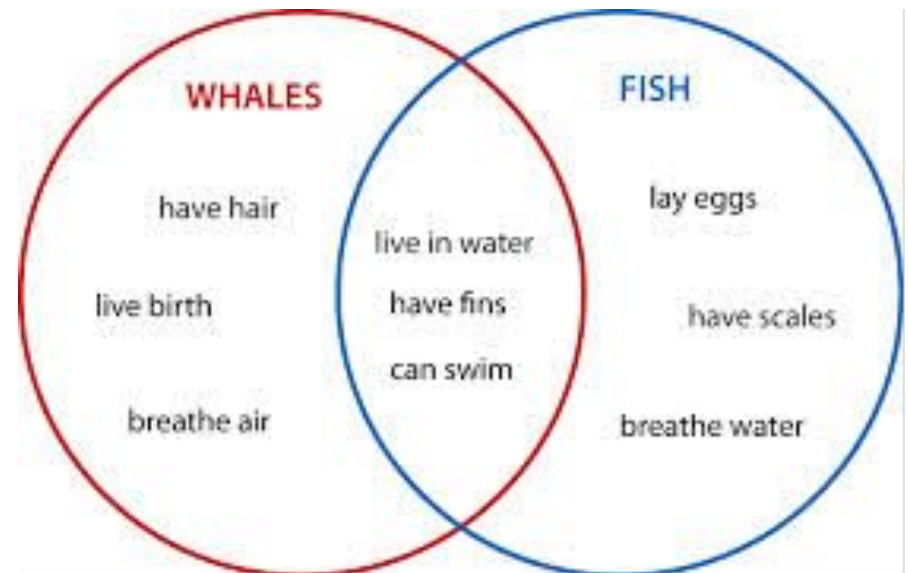
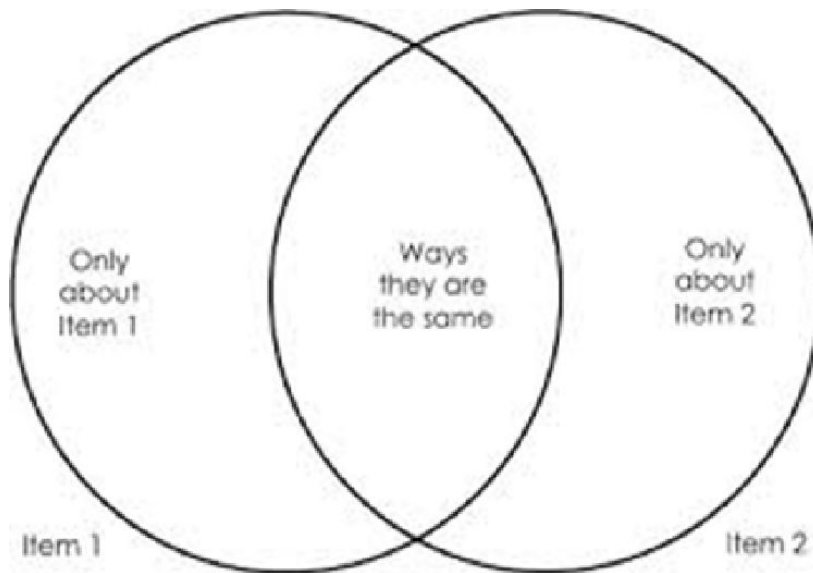
Model of the concept map

(<http://milcord.com/milcord-blog/2009/11/25/concept-map-vs-powerpoint-for-briefings>)

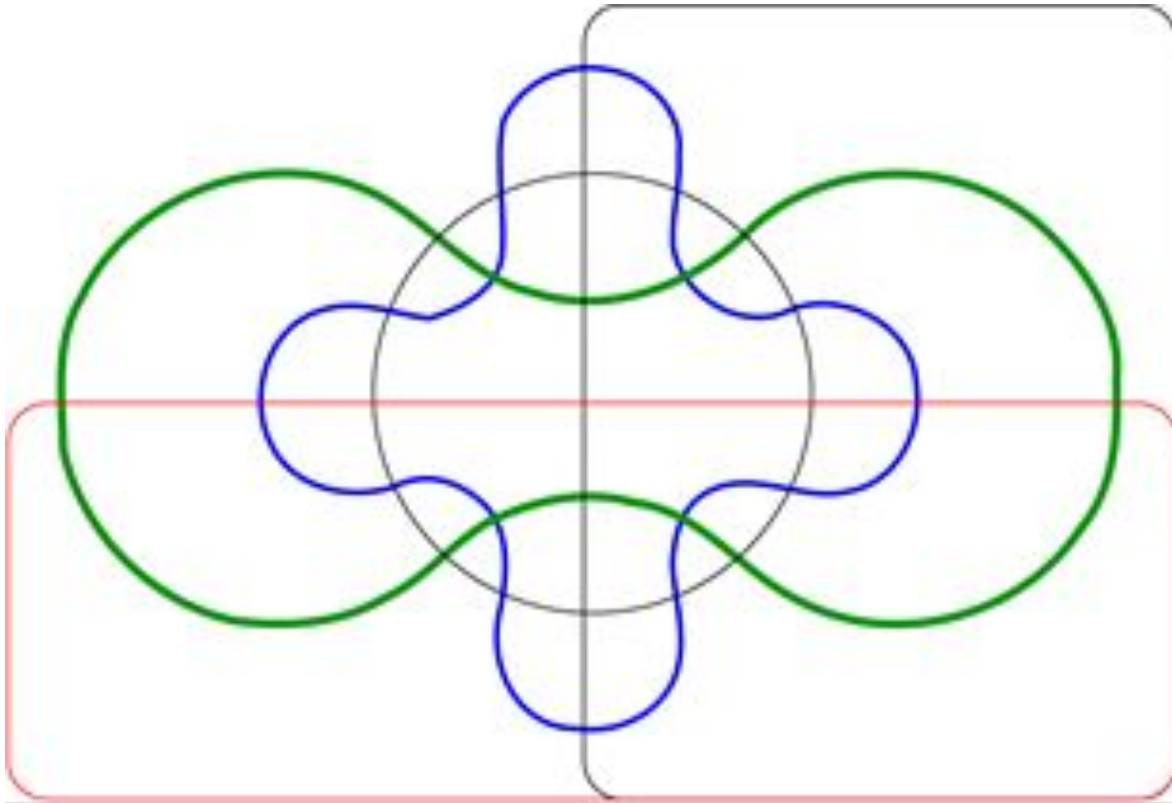
Venn Diagrams

A diagram that uses circles to represent sets. Relations between the sets can be indicated by the arrangement of the circles, as for example by drawing one circle within another to indicate that the first set is a subset of a second set.

(The American Heritage® Dictionary of Student Science, Second Edition. Copyright © 2014 by Houghton Mifflin Harcourt Publishing Company).



Venn Diagrams can be very complex



Example of complex Venn Diagrams (<http://www.learnnc.org/lp/pages/2646>)

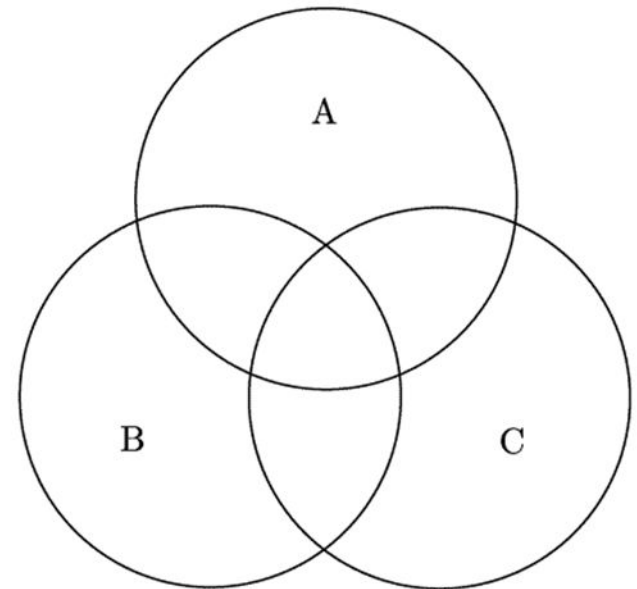
Example of making decision with Venn Diagram

Example: You have \$ 2,000 in the inheritance from a distant relative. You always wanted to go on a trip to France (or Spain, or...), but also you want to renovate your dilapidated bathroom. Also your friends sell their cottage with 50% discount, and you dreamed of having your own piece of land with a garden.

Try to determine with the help of Venn diagram what to do with the money better, what are the advantages and disadvantages of each of the solutions.

Results: A - cottage, B - a journey
C - bathroom. AB – it may no longer be the opportunity to buy a cottage with such discount;
AC - bathroom will improve your daily life more than a cottage; BC - the money was unexpected and so they can be spend at a least practical purpose.

ABC - the final decision - a journey.



Activity 4. Brainstorming with Venn Diagram

Phase: criticism prohibited

1. The problem - you have decided to get married and the issue of housing aroused.

2. Propose the possible solutions (to live with the husband's parents, rent an apartment ...) and fill in basic circles Venn diagram.
Draw them on the board.

3. Fill the diagram intersections with advantages and disadvantages of each solution.

Phase: criticism is allowed

4. Discuss what you might have missed, which is unrealistic.

5. Taking into account the advantages and disadvantages of each solution, select the optimal one.

6. What has happened as a result ???

Chart

- Consider brainstorming with a chart if you have two or more elements that you want to compare and contrast. Charts let you clearly see how each item is similar to the others, and how it differs.
- In order to make an effective chart, you need to define the elements you wish to compare, and then come up with two or more areas in which to compare them.
- Then, you may need to conduct some research to accurately fill out your chart. The chart will keep you focused on your purpose, and on relevant information as you conduct your research.

Example of using the chart

- You are trying to decide whether to take a job offer in another region or stay where you are. The considerations are salary, housing, schools, and standard of living. While you already have the salary information, you will need to go to the library or Internet to find out the other facts you need to make your comparison.
- To guide you in your search, you create a chart that looks like this:

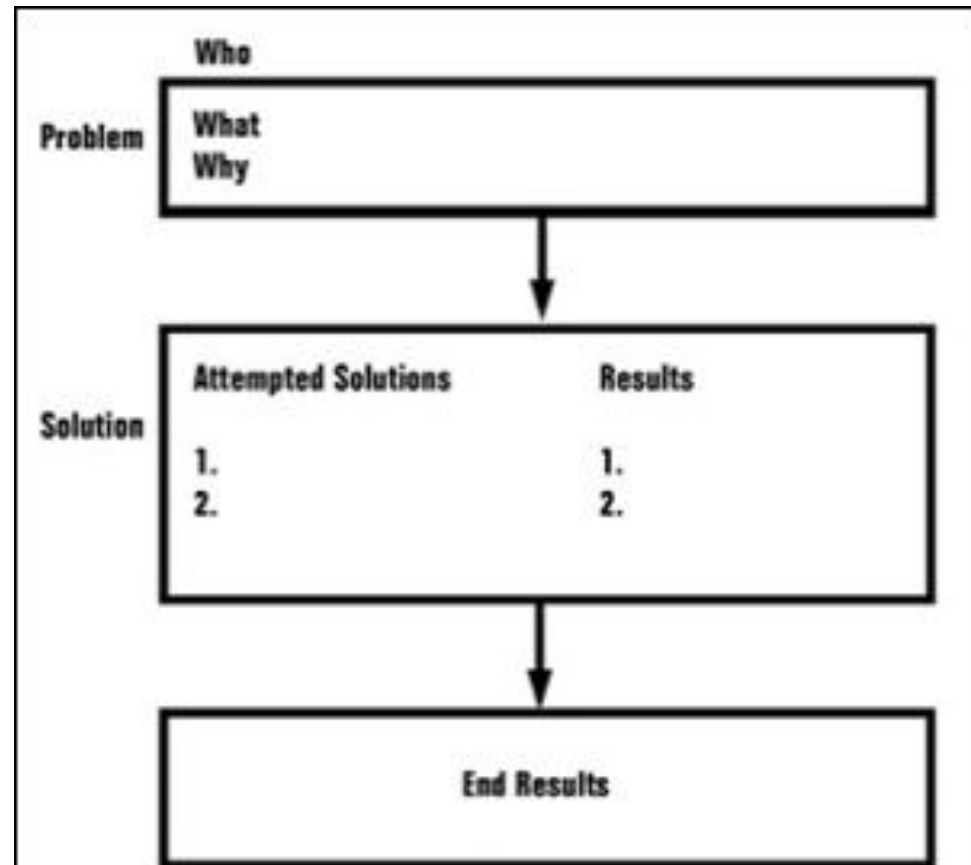
Decision	Salary	Housing	Schools	Standard of Living	Total score
Move to east	5	3	4	5	17
Stay in west	1	5	5	2	13

You can add your assessment in scores by 5-points scale and calculate the best decision of your problem.

Problem / Solution Outline

This type of graphic organizer is useful because the act of filling it out forces you to:

1. clearly delineate the problem at hand, including causes and effects
2. come up with solutions, and even possible outcomes of those solutions



Example of Problem / Solution Outline

Causes	Problems (fill in as many as applicable)	Effects
rent is going up; neighbors are noisy	<p><i>Who:</i> me and my family</p> <p><i>What:</i> should we buy a house or continue to rent a condominium?</p> <p><i>Where:</i> hometown</p> <p><i>When:</i> lease is up in two months</p> <p><i>Why:</i> possibly save money, build equity, improve quality of life</p> <p><i>How:</i> not applicable for problem</p>	<p>If we buy: monthly payment would decrease, so have more money to save or invest; also would have more privacy and quiet. If we continue to rent: won't have moving expenses; will pay more in rent, so have less money to save or invest; will continue to have little privacy and noisy neighbors</p>

Example was taken from L. Starkey, 2004

Example of Problem / Solution Outline (continuation)

Possible Solutions

1. establish budget for home purchase, get pre-approved for mortgage, and go house hunting to see if we can find something in next two weeks within budget
2. remain in condo for another year while saving more money for a down payment

Possible Outcomes

1. find suitable house, secure mortgage, purchase house, move in
2. live with noisy neighbors for one more year, have bigger down payment and more time to look for house

Activity 5. Making rational decision with Problem / Solution outline

Your company has been selling its hammers to its distributors for €3 a piece. It costs €2.30 to manufacture each hammer. Your boss asks you for ways to decrease manufacturing costs in order to increase profits. Create a problem/solution outline to represent this scenario.

Causes	Problems (fill in as many as applicable)	Effects
	<i>Who:</i> <i>What:</i> <i>Where:</i> <i>When:</i> <i>Why:</i> <i>How:</i>	

Activity 5. Making rational decision with Problem / Solution outline (continuation)

Possible Solutions

- 1.
- 2.
- ...

Possible Outcomes

- 1.
- 2.
- ...

Activity 10. (Homework)

Task 1. After first 2 contact hours students at home record thoughts about today's session in their diary. After the lessons students should show it to the teachers for the formative assessment.

Task 2. After first 2 contact hours students at home read 3. Recommendations for critical reading and evaluating information and 4. Recommendations for effective report writing from main content, chose some scientific article (which will be interesting for you, each student – different article), find and copy out phrases for own phrasebook of academic / critical writing. This phrasebook will be the part of student's portfolio. After the lessons students should show it to the teachers for the formative assessment.

These assignments will be considering as a part of formative assessment.

Task 3. After second 2 contact hours students should write at home some elements of their PDP using their new knowledge about critical thinking. We offer students in theirs PDP to set clear, written goals for theirs future and made plans to accomplish them. They can use visual means and other skills that are the critical thinking competences to do this task effective.

These task will be considering like a part of a summative assessment.

Thank you for your attention and activity!

