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Social networks
Material for students

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Introduction

Resolution

In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge.

Definitions

Knowledge – it implies that we have information, but information does not imply having knowledge. We need good reasons based on which we believe that information is true to meet the necessary conditions of knowledge.

Information – facts presented in an orderly manner suitable for transfer.

Education – the process of providing and acquiring systematic training and systemically shaped knowledge, particularly in educational institutions.

Online education – transfer of knowledge through instruction via the Internet in a pedagogical sense, meaning that reading articles online on a topic does not mean online education, but involvement in some sort of lecture or course.

Social networks – websites and applications enabling users to communicate with each other by posting information, comments, messages, photos and video content.

Knowledge dissemination – an interactive process of knowledge transfer; increasing the availability of desired knowledge and its comprehension to the target groups.

Introductory questions

Do you remember how the Internet was used only a few years ago?

What has changed?

Could you have presumed then what would change?

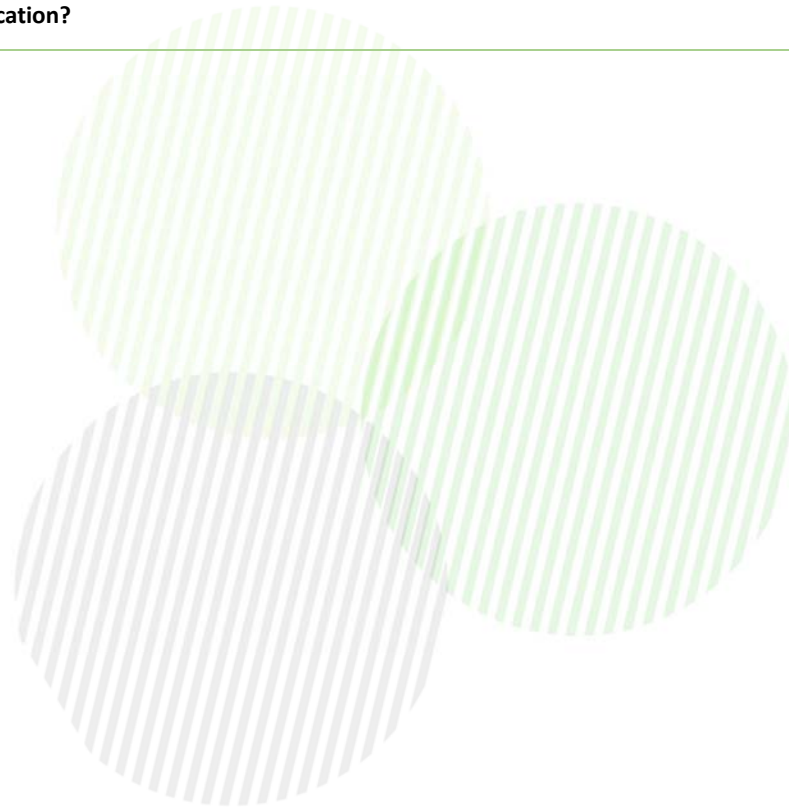**Do you think it is at all possible to foresee how the Internet would be used in the near future?**

Why is it possible or impossible?

Will this change increase your knowledge?

Will you have a better education?

Worksheet

Topic
Structure of information networks
Resolution
In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge.

Task 1.

The "Introduction" tab provided by the teacher contains a set of questions to help prepare arguments for the debate. On their basis, prepare a set of arguments and group them into those that are clearly PRO the resolution, AGAINST the resolution and those arguments that can be used by both sides. Enter them in the appropriate places in the table.

PRO	DEBATABLE	CON
1. The Internet will make all forms of education even more available in the nearest future. 2. Online teaching brings enormous benefits over traditional forms of knowledge transfer. 3. The Internet is an excellent medium for the presentation of knowledge. 4. The Internet is a natural testing ground for critical thinking.		1. Information found on the Internet is unreliable. 2. The Internet is conducive to the expansion of pseudoscience. 3. The expansion of social networks on the Internet jeopardizes education. 4. The Internet forces us to be surrounded by like-minded people.

FACTS FOR PROPER ARGUMENTATION

Below you will find Info cards, Story cards and Question cards. Read them carefully and analyse in order to formulate good arguments for the debate.

Info card 1 Facts and data	Info card 2 Facts and data	Info card 3 Facts and data	Info card 4 Facts and data
The Internet will make all forms of education even more available in the nearest future. Not without reason, there is a popular saying that information is only a click away today. This also refers to scientific information which was very difficult to access previously, with experts in a certain field being scarce. We can easily conclude that the Internet will make any form of education even more accessible in the nearest future, as the speed of data transfer and the cheapness of using the Internet increase. Not only is information easily available, but it is entering parts of the world where no one expected it only a few years ago. Soon it will not matter whether you are in some remote part of Africa or Asia or in Europe and North America, in terms of the accessibility of the required knowledge. This does not only refer to "digested" scientific knowledge, but also to "raw" data which you use to draw conclusions and make discoveries you are looking for. The availability of scientific evidence will thus lead not only to the geographical expansion of education, but also to the expansion of creative education and liberation from educational authorities.	**Online teaching brings enormous benefits over traditional forms of knowledge transfer.** In the United States, the number of students attending some form of online teaching is growing by more than five percent each year. Trends from higher education are spilling over into high school education and over to elementary education, and so far all the trends connecting the Internet and education coming from the US have unmistakably reflected on the rest of the world. Online teaching, whether through programs such as Skype or through specialized Internet-based education platforms, brings enormous benefits such as a drastic reduction in student travel and accommodation costs, great comfort due to the unlimited options of places for the transfer and adoption of education, the maintenance of direct contact between teachers and students, and even the possibility of interaction between them any time and any place, whenever and wherever the need arises. An increasing number of top universities even offer their courses online for free, so top educational content will overcome political, spatial, temporal, and even class and socio-	**The Internet is an excellent medium for the presentation of knowledge.** The way knowledge is outlined and presented is of key importance for the educational process. From the first days of the Internet, multimedia has attracted content creators as a powerful teaching tool, which surpassed all previous teaching aids in all aspects, especially for its attractiveness and the way in which it captivated the attention of students. From the fascination with hypertext from the prehistory of the Internet, which was an unprecedented opportunity to connect and intersect information, to the complex audio-visual content and text organization, which was made possible by the advancement of technology, education experts could barely keep up with the astonishing speed of innovation. In the near future, virtual reality (VR) and augmented reality (AR) technology will bring unforeseeable opportunities for the presentation of educational content and the acquisition of knowledge, which is a big challenge for experts in the field of education.	**The Internet is a natural testing ground for critical thinking.** You can check any information from your boring textbook on the Internet. It is a treasure trove of ideas that your teacher did not even think of. Maybe things do not work like that in nature, society, or even in engineering and technology, nor do they work the way you are taught in school? If you can't find an article, graphic or multimedia about it, you can meet someone who knows more about it and ask for more information. Technical innovations will become literally visible. The Internet helps to update education in the field of engineering and sciences, where knowledge is advancing the fastest. And as for the communication over the Internet with people who possess knowledge - as many people, as many points of view there are and completely new and inconceivable perspectives. New knowledge will be able to enter even the most conservative and closed environments. It will break down barriers of ideologies and prejudice. It will destroy ideologies and prejudice. With the Internet we will finally be able to use our own heads!

economic barriers.			
Info card 5 **Facts and data**	**Info card 6** **Facts and data**	**Info card 7** **Facts and data**	**Info card 8** **Facts and data**
Information found on the Internet is unreliable. It is difficult to check the quality of online sources. Even the most popular and largest online encyclopedia, Wikipedia, is not an acceptable knowledge source, if we use it for scientific research and education. Traditional system of editing and reviewing, typical for books and journals, is almost non-existent on the Internet. And where this process is present, additional checks are needed to determine the credibility of the system. Even if teachers and students are able and competent to conduct such checks, the effect of speed of access to information on the Internet is jeopardized by the time required for checks. Furthermore, we will often find inconsistent and contradictory information in our searches. If it is at all possible to do the difficult forensic detective work of establishing the truth, the ease of accessing content on the Internet is largely nullified by problems with verifying the authenticity of the content. Moreover, the ease as such is a natural cause of thoughtlessness, haste, and even laziness, and in the context of knowledge acquisition on the Internet, this	**The Internet is conducive to the expansion of pseudoscience.** It is in direct relation with the previous problem, but also intertwined with old, well-known socio-psychological problems. The expansion of pseudoscience is not limited only to phenomena such as conspiracy theories, but similar processes appear within the scientific community, and even in the so-called hard sciences and technical sciences. First of all, there is a psychological tendency of people to close themselves in exclusive groups and groups of like-minded people, which is much easier to display with the advent of the Internet. People enjoy indulging in each other on the Internet and feeling that they have knowledge that others do not have or that they understand things that others do not understand. Such exclusive groups see themselves as creators of some alternative education. The endless depository of data on the Internet is a perfect source of alleged supporting evidence for the most bizarre theories, but this does not only stand for pseudo-scientific conspirators, but also for experienced and renowned educators who can often abuse them for entertainment, selfish, psychological or	**The expansion of social networks on the Internet jeopardizes education.** If there is anything certain about the impact of the Internet on education, it is that the activity of Internet users on social networks will be increasing, and their impact on education will be higher accordingly. When we talk about the unreliability of information and the pseudoscience on the Internet, social networks are a real cacophony of information. The socio-psychological phenomena that have already been mentioned, as well as many others, including the greatest enemy of education, pliability for the immediate environment, appear on social networks in a multiplied form. Furthermore, the very format of social networks nurtures the echo chamber effect, where your voice echoes multiple times in the circle of your "friends" or "followers". Such a format of social networks jeopardizes the ability to realistically and objectively perceive reality, which is a precondition for knowledge acquisition, but also for breaking personal prejudice and, what is most dangerous, for adopting innovations. Social networks are the biggest enemy of critical thinking!	**The Internet forces us to be surrounded by like-minded people.** Groups such as *After Monday and Tuesday even the Calendar says W T F …*, *"Dammit I'm mad" is the same spelt backwards! Mind blowing isn't it*, or *If 1,000,000 people join this group, nothing will happen*, can hardly be suspected of giving rise to malicious social, political, or religious fragmentation, but there are other groups on the many social media platforms and dedicated blog sites that very well may. What these installations have in common is that they may serve as echo chambers at worst, where over and over one lends ear to repetitions of one's own conviction from fellow partisans. The lack of new, extraneous, and competing expressions of opinion can motivate fragmentation in society, which is neither innocent — let alone beneficial. In line with the ever-growing information specialization and screening on the Web and in the media, with more or less cunning and finesse, one may construct profoundly individualized communication packages that filter annoying voices and incompatible noisy information out, that one

phenomenon can appear multiplied.	other reasons.		doesn't care to listen to.
			With digitization, the costs of transferring and publishing information have become negligible. It is an environment where everyone has their own online world. Facebook, Google, Reddit, Amazon, YouTube and Twitter are personalized information architectures that provide us with the majority of – no longer shared – background knowledge within which we live and act.
			Social networks offer us more and more similar opinions and beliefs!

Stories	Stories
STORY 1 (PRO) The advantages of the Internet over more traditional media are numerous. In this new electronic environment, flat, paper-based research articles can become multi-layered, cross-referenced, live resources with integral audio and visual material and links. Users can, from a single entry point, explore and capture numerous additional bundles of information from organizations and individuals across the world. Through a growing number of e-mail newsgroups and focused discussion forums, researchers and research users can communicate and collaborate with extensive networks of professionals and public interest groups; here they can keep pace with many developments long before they reach a print outlet (indeed, assuming they ever do). It is this speed and flexibility of information exchange that represents probably the single most important benefit of the Internet. Ongoing software advances bring new possibilities all the time—user profiling, for example, paves the way for the specific information needs of different users to be anticipated and for personalized channels to be provided through web sites in the search for the required information. The Internet also provides an outlet for a wealth of research material that is typically missed by the mainstream journals and print publications because it does not meet their requirements of evidence, because it is not considered unique or newsworthy enough, or simply because the researchers (frequently non-academic) have too many other priorities and never find the opportunity to produce the findings in a suitable format. The Internet allows this 'grey literature' which contains valuable information of use to many health researchers and practitioners, especially about work at a local level, to be provided on a widely accessible platform. And not least, the Internet represents a powerful democratizing force in research. The accessibility of many 'professional' sites by lay members of the public and the increasing attention being paid by organizations to the rights of 'consumers' to have access to research information, especially when it is publicly funded, are making researchers more accountable. This will increase the expectation on researchers and research translators to present findings in different formats, with different audiences in mind, in plain language and in summary rather than only in the often overlong and overblown academic style. Source: Mary Duffy, *Health Promotion International*, Vol. 15, Issue 4, December 2000,	**STORY 1 (CON)** This means that in order to tap into the potential wisdom made available by the fountain or fire hydrant of the Internet, we need to be able to make the right kind of selections, aggregations, and inferences. Unfortunately, the celebrated wisdom of crowds is far from guaranteed to kick in online. When it comes to uploading information to the public space of the Internet, there are generally no gatekeepers of truth, nor any requirement for providing breadcrumbs to track it. This means that knowledge available online is not only distributed, it is also buried in layers of noise, special interests, and irrelevant information preventing crowds from reaching the truth by such blind aggregation. Online, then, the toolbox of knowledge is a regime that is needed more than ever. When entering public space online, the first thing that strikes us is the quantity and complexity of the system. Hence, the first thing everyone needs is some kind of guide or librarian to direct one's attention relative to one's purpose or interest. Free browsers, such as Google Chrome, Safari, Mozilla, and Internet Explorer, are the favorite tools these days and stand ready for users. However, as everyone ultimately learns, nothing comes for free. Like tourist guides in murky towns, browsers are corrupt. Their primary reason for existence is not to guide you, but to make money for their owners by guiding you past particular online commercials and stores. Of course, since the public space of the Internet offers vast numbers of returning costumers, this business model has to delicately balance purpose with profit and thus be largely useful to the visitor. This has led to a compromise where most people think of temporary derailments to online advertisements and viewing top-of-the-list suggestions as a kind of tip paid to a helpful waiter who is just doing his job. Still, a problem with this business model is the fact that the online guides work quantitatively, not qualitatively, with information. Information competes intensively to spread and survive within environments largely insensitive to truth tracking, but based on links, likes, and lust. A whole industry known as "Search Engine Optimization" (SEO) has thus emerged around search engines to help promote any kind of information that pays relative to all other competitors. Still, such a system of distributed knowledge buried in information has its limits. The main one is that conceived as such, the Internet is confined to being a library, where search engines direct user attention to sources of information when they are looking for an answer. SEO made sure that the answer arrived at too often was not relevant to individual users. Thus, to go to the next level, the

Pages 349–353, https://doi.org/10.1093/heapro/15.4.349

STORY 2 (PRO)

Virtual reality (VR; also known as virtual environment) uses computer generated imagery and human computer interfaces to create the effect of a three dimensional world where the user interacts directly with the virtual object using a number of peripheral devices. The key in VR is that it is 3D, interactive and most importantly it creates the effect of interacting with things, not with pictures. As Bryson states, " it is an effect, not an illusion". Perhaps because of the computer and game industry, and associated open-source and game engine toolkits, there is interest in using such VR, immersive technologies for education and for engaging the students. Students can take advantage of the affordances of simulated environments, exploring a scenario's dimensions and pitfalls as they learn. This motivational iterative process, the learning-while-doing, is very important. The ability to work "hands-on" and view objects from multiple viewpoints made possible by VR can deepen learning and recall for a student because the student is experiencing the construction of new knowledge. This type of experiential learning promotes the construction of knowledge by the student, where learning is characterized as a series of cognitive restructurings. The learner's conceptual framework undergoes structural modifications or revisions based upon new experiences, information, or concepts the learner encounters. This process would allow the learners' cognition to move from representational learning to conceptual learning, a process enabled by VR. If this process does not occur, then the learner stays in the stage of representational learning, i.e., rote memorization. As pointed out in the Introduction, rote memorization as an educational strategy is not a good option since students' success may depend upon their ability to envision and manipulate abstract multidimensional information spaces. Studies show that a virtual environment can "stimulate learning and comprehension, because it provides a tight coupling between symbolic and experiential information". Chee states that experience is necessary for optimal learning, and that physics students have little "feel" and "understanding of the qualitative dimensions of the phenomena they study". VR can be used to provide "a foundation for students' conceptual and higher order learning". A good example of a successful VR system in Optics is the MaxwellWorld system. This system allows students to explore electrostatic forces and fields, learn about the concept of electric potential, and discover the nature of electric flux. This is partly because students cannot draw analogies to personal experiences that provide metaphors. In this VR system, students build 3D electric fields and explore forces and energy by directly manipulating 3D representations of test charges, field lines,

Internet had to evolve in such a way that users would feel like coming back more frequently, using the Internet for more than a library, and, when using it, getting more relevant information. To solve this problem, the Internet became social.

Source: Vincent Hendricks and Pelle Hansen, *Infostorms: Why do we 'like'?*

STORY 2 (CON)

Fortunately, social media are often just mere vessels carrying links to more substantial sites of information. Each of us may carry a library of ideas and exchange with us to the online public, with links to the books we prefer. Still, we easily forget that the algorithmic librarians will only announce information based on each of their separate architectural principles: Google, if many others have linked to them as well; Twitter, if you are popular; and Reddit, if it is controversial. Further, if you are willing to pay, they will all announce almost any corrupted message at the top of the list. In addition, the books and information of the online library remain unchecked by gatekeepers and editors. For a while, there was hope that users in fields of open commentaries could maintain this function. But as anonymous trolls have wrecked these fields in most sites, many digital public squares that we had set our hopes on have been closed for comments. Those who have remained open are like dark forests where the trolls of the Internet will jump you as soon as you make a sound. With digitization, the library has become a new and unchecked world of information with few known rules besides language. It's a place where your identity and letters may be stolen, your Steam account may be hacked every week, and where few have jurisdiction beyond their own private lot. Where can you go for justice when half of your social media accounts have been hacked and are floating around in some cloud currently over the U.S., and the rest is pieced together from a number of servers in 20 countries in the Western Hemisphere? It's a fiction where the consequences are real. It's a town where kids run around unaccompanied in a society of porn and people wearing masks while burning other people in cages. It's a Wild West of organization, the dark Middle Ages of information, or a Modor of civilization, if you like.

Source: Vincent Hendricks and Pelle Hansen, *Infostorms: Why do we 'like'?*

equipotential surfaces, flux surfaces, etc. These authors also report that students had a greater understanding of the distribution of forces in an electric field, as well as representations such as test charge traces and field lines. They also state that the three-dimensional nature of VR aids with learning and that the virtual reality experience is more motivating for students than a comparable 2-D microworld.

Source: The use of high technology in STEM education
Vasudevan Lakshminarayanan; Annette C. McBride
Proceedings Volume 9793, Education and Training in Optics and Photonics: ETOP 2015; 97930C (2015) https://doi.org/10.1117/12.2223062

Issue card 1 Questions	Issue card 2 Questions	Issue card 3 Questions	Issue card 4 Questions
Question / Issue: An enormous corpus of suspicious information, and even complete pseudoscience, has become increasingly available. Doesn't that jeopardize education?	**Question / Issue:** Does online education lack lively and direct human interaction between teachers and students? Is it a fertile ground for mass production of fake diplomas?	**Question / Issue:** Doesn't that mean the domination of form over content, where the cognitive value of content steps back before the glare of presentation?	**Question / Issue:** Does the format of social networks force us into the circles of "friends" and "followers" who then cultivate bias, thus damaging critical thinking.

Issue card 5 Questions	Issue card 6 Questions	Issue card 7 Questions	Issue card 8 Questions
Question / Issue: Even Wikipedia has been cleared up by an army of top experts. Isn't this an exaggeration, because there are still verified websites we can trust?	**Question / Issue:** Even if the Internet has led us into such temptations, using the Internet is the only cure to beat or overcome those temptations.	**Question / Issue:** It depends on who you hang out with. Social networks allow you to have people who can teach you a lot treat you as true "friends".	**Question / Issue:** The Internet and social networks do not necessarily make us surrounded by like-minded people. A smart user can avoid these traps.

Prepare arguments for the discussion. One group of students prepares arguments supporting the resolution, the other one has contradictory arguments. Use the proposed scheme.

ARGUMENT NO. 1.

Argument	Foreseen rebuttals of the other group	Answers to rebuttals

ARGUMENT 2.

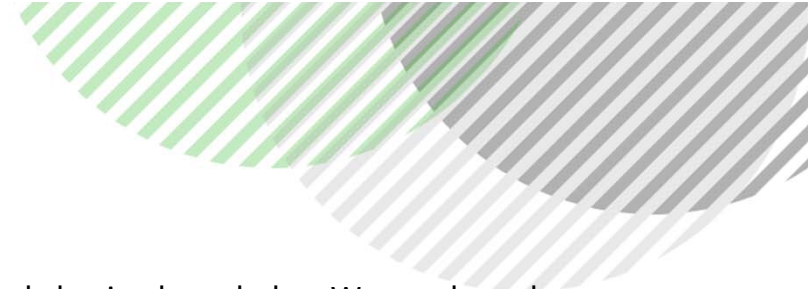| Argument	Foreseen rebuttals of the other group	Answers to rebuttals

ARGUMENT 3.

Argument	Foreseen rebuttals of the other group	Answers to rebuttals

Basic terms

- **Knowledge** – it implies that we have information, but information does not imply having knowledge. We need good reasons based on which we believe that information is true to meet the necessary conditions of knowledge.

- **Information** – facts presented in an orderly manner suitable for transfer.

- **Education** – the process of providing and acquiring systematic training and systemically shaped knowledge, particularly in educational institutions.

- **Online education** – transfer of knowledge through instruction via the Internet in a pedagogical sense, meaning that reading articles online on a topic does not mean online education, but involvement in some sort of lecture or course.

- **Social networks** – websites and applications enabling users to communicate with each other by posting information, comments, messages, photos and video content.

- **Knowledge dissemination** – an interactive process of knowledge transfer; increasing the availability of desired knowledge and its comprehension to the target groups.

Introductory questions

- Do you remember how the Internet was used only a few years ago?

- What has changed?

- Could you have presumed then what would change?

- Do you think it is at all possible to foresee how the Internet would be used in the near future?

- Why is it possible or impossible?

- Will this change increase your knowledge?

- Will you have a better education?

RESOLUTION: In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge.

Source: Flickr

PRO

1. The Internet will make all forms of education even more available in the nearest future.

2. Online teaching brings enormous benefits over traditional forms of knowledge transfer.

3. The Internet is an excellent medium for the presentation of knowledge.

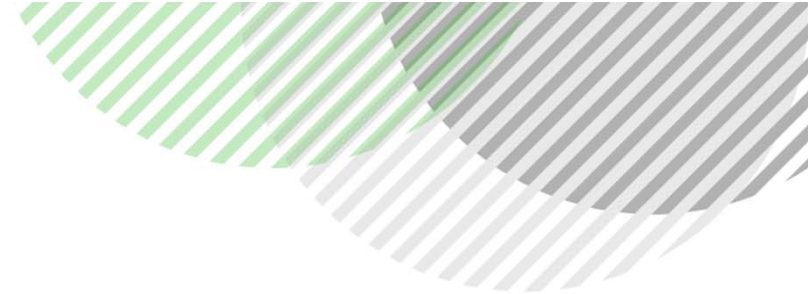4. The Internet is a natural testing ground for critical thinking.

CON

1. Information found on the Internet is unreliable.
2. The Internet is conducive to the expansion of pseudoscience.
3. The expansion of social networks on the Internet jeopardizes education.
4. The Internet forces us to be surrounded by like-minded people.

1. The Internet will make all forms of education even more available in the nearest future. (PRO)

Извор: Pxhere

- Education is more and more accessible because of the speed of data transfer and the cheapness of using the Internet.

- Not only is information easily available, but it is entering parts of the world where no one expected it only a few years ago.

- This does not only refer to "digested" scientific knowledge, but also to "raw" data which you use to draw conclusions and make discoveries you are looking for.

- The availability of scientific evidence will thus lead not only to the geographical expansion of education, but also to the expansion of creative education and liberation from educational authorities.

1. Information found on the Internet is unreliable. (CON)
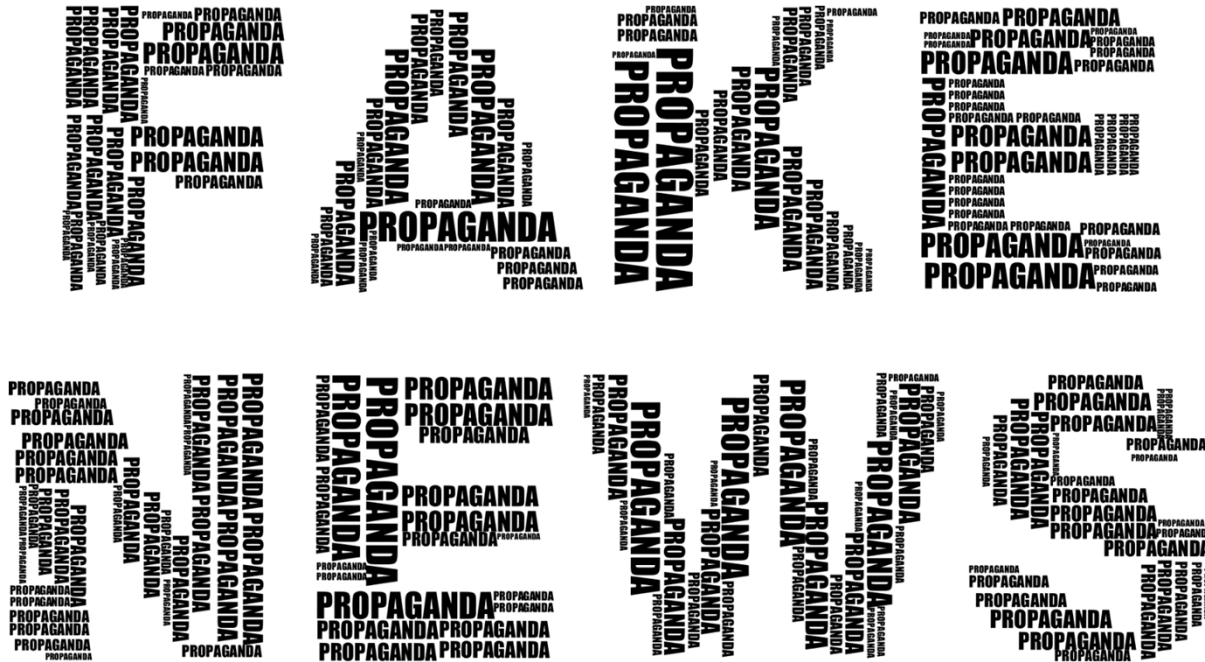
Source: Pixabay

- Traditional system of editing and reviewing, typical for books and journals, is almost non-existent on the Internet

- We will often find inconsistent and contradictory information in our Internet searches.

- The ease of accessing content on the Internet is largely nullified by problems with verifying the authenticity of the content.

2. Online teaching brings enormous benefits over traditional forms of knowledge transfer. (PRO)

Source: Piqsels

- In the United States, the number of students attending some form of online teaching is growing by more than five percent each year, and this trend is appearing in other countries.

- Drastic reduction in student travel and accommodation costs, great comfort due to the unlimited options of places for the transfer and adoption of education, the maintenance of direct contact between teachers and students are great benefits.

- An increasing number of top universities even offer their courses online for free.

2. The Internet is conducive to the expansion of pseudoscience. (CON)
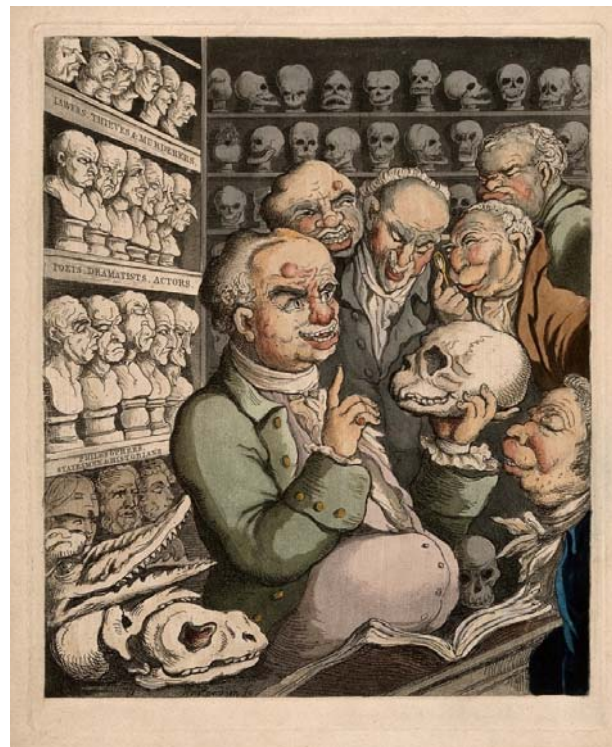
Source: Wellcomecollenction

- The expansion of pseudoscience is not limited only to phenomena such as conspiracy theories, but similar processes appear within the scientific community.

- There is a psychological tendency of people to close themselves in exclusive groups and groups of like-minded people, which is much easier to display with the advent of the Internet.

- The endless depository of data on the Internet is a perfect source of alleged supporting evidence for the most bizarre theories.

3. The Internet is an excellent medium for the presentation of knowledge. (PRO)

Source: Needpix

- The way knowledge is outlined and presented is of key importance for the educational process.

- From the first days of the Internet, multimedia has attracted content creators as a powerful teaching tool.

- In the near future, virtual reality (VR) and augmented reality (AR) technology will bring unforeseeable opportunities for the presentation of educational content and the acquisition of knowledge.

3. The expansion of social networks on the Internet jeopardizes education. (CON)

Source: Pixabay

- The activity of Internet users on social networks will be increasing, and their impact on education will be higher accordingly.

- The socio-psychological phenomena that have already been mentioned, as well as many others, including the greatest enemy of education, pliability for the immediate environment, appear on social networks in a multiplied form.

- The very format of social networks nurtures the echo chamber effect, where your voice echoes multiple times in the circle of your "friends" or "followers".

- Social networks are the biggest enemy of critical thinking!
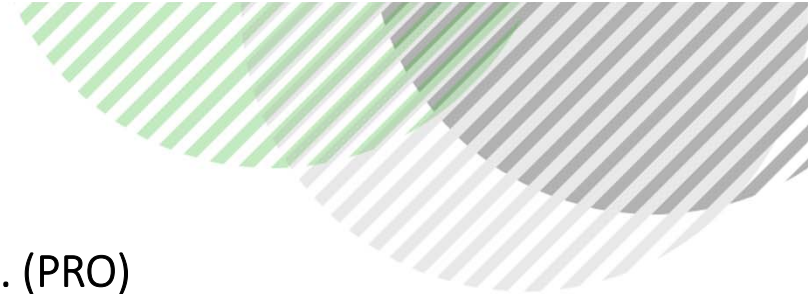
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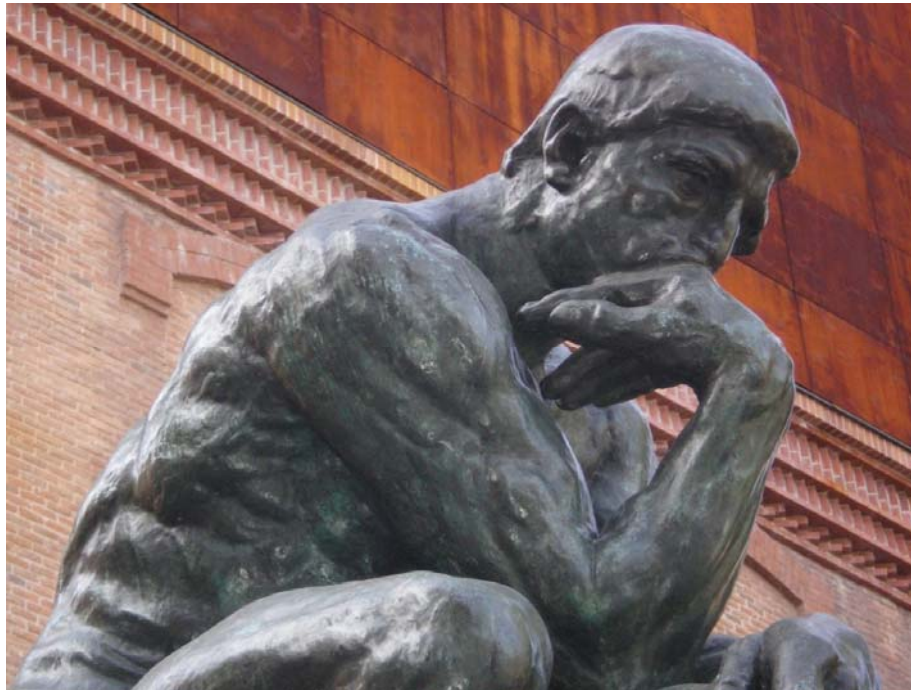
Source: Wikimedia Commons

- On the Internet, you can check any information from your textbook that you missed in class.

- The Internet helps to update education in the field of engineering and sciences, where knowledge is advancing the fastest.

- New knowledge will be able to enter even the most conservative and closed environments.

- With the Internet we will finally be able to use our own heads!

4. The Internet forces us to be surrounded by like-minded people. (CON)

Source: Pixabay

- Many social media platforms and dedicated blog sites contain groups which encourage malicious social, political, or religious fragmentation.

- This way, they give rise to echo chambers where we hear convictions of like-minded people over and over.

- Facebook, Google, Reddit, Amazon, YouTube and Twitter are personalized information architectures that provide us with the majority of background knowledge within which we live and act.

- Social networks offer us more and more similar opinions and beliefs!

Story 1 (PRO)

- The advantages of the Internet over more traditional media are numerous.

- It is this speed and flexibility of information exchange that represents probably the single most important benefit of the Internet.

- The Internet also provides an outlet for a wealth of research material that is typically missed by the mainstream journals and print publications.

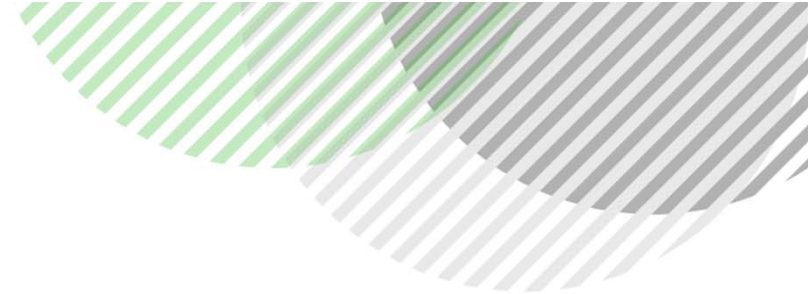- The Internet represents a powerful democratizing force in research.

Source: Flickr

Story 1 (CON)

- The knowledge available online is not only distributed, it is also buried in layers of noise, special interests, and irrelevant information preventing crowds from reaching the truth by such blind aggregation

- Their primary reason for the existence of Internet browsers is not to guide you, but to make money for their owners by guiding you past particular online commercials and stores.
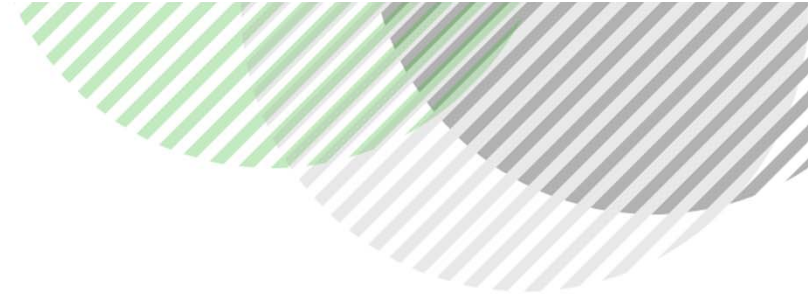
Source: Pixabay

Story 2 (PRO)

The key in VR is that it is 3D, interactive and most importantly it creates the effect of interacting with things, not with pictures.

Studies show that a virtual environment can "stimulate learning and comprehension, because it provides a tight coupling between symbolic and experiential information".

Source: Pxfuel

The books and information of the online library remain unchecked by gatekeepers and editors.

Many digital public squares that we had set our hopes on have been closed for comments, and those who have remained open are like dark forests where the trolls of the Internet will jump you as soon as you make a sound.

It's a Wild West of organization, the dark Middle Ages of information, or a Modor of civilization.

Source: Wikipedia

VIDEO MATERIAL:

Mašan Bogdanovski, PhD/ ODYSSEY Debate: In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge

https://youtu.be/EPlOyDXEMaU

Predrag Đukić – The Internet and education

https://youtu.be/3qVUY8H3UUQ

Should technology replace teachers? | William Zhou | TEDxKitchenerED

https://youtu.be/LIR60cgfOFU

The internet has killed education as we know it | Elizabeth Boese | TEDxCU

https://youtu.be/B1AiU7yAyO

Daphne Koller: What we're learning from online education

https://youtu.be/U6FvJ6jMGHU

Is the Future of the Internet the Future of Knowledge?

https://youtu.be/vFzZ-HMPAVg

Why Internet Rumors Spread So Quickly

https://youtu.be/g8GKJ1GwFvg

PHILOSOPHY - Epistemology: Introduction to Theory of Knowledge [HD]

https://youtu.be/r_Y3utIeTPg

In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge

Material for teachers

With methodological guidelines, a lesson plan and an answer key to worksheets

The educational package "In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge" was developed within "Oxford debates for Youths in Science Education" project.

It is a key material, facilitating the achievement of primary project goals, including increasing reasoning skills and interest in STEM, which in the future may result in taking up a scientific career.

When preparing students for the debate, one should not neglect the development of such skills as: communication excellence, argumentation or public speaking. Students should improve their ability to persuade effectively, argue properly, reason accordingly and speak out correctly. Composition of texts, using rhetorical means in oral statements, speaking in accordance with the rules of language culture, text interpretation, public speaking and presentation of texts, discussions and negotiations are of equally high importance.

In order to achieve the abovementioned goals, the implementation of thematic educational packages should be preceded by classes dedicated to preparation for debating as such. This can be accomplished in consultation with teachers of other subjects and the class teacher. The development of basic communication skills can be included in the class teacher's work plan, and the prepared lesson plans can be used during regular classes. Auxiliary materials can be found in the following documents:

1. **Warm up practice** – Annex No 2 to National frameworks for implementation of Oxford debates in STEM in school practice ;
   This document includes the following exercises: active listening, public speaking and debating skills.

2. **Lesson plans aimed at general development of debating skills** – Annex No 2 do National frameworks for implementation of Oxford debates in STEM in school practice ;

   This material consists of 7 lesson plans prepared by Dr. Foteini Englezou, president of the Hellenic Institute for Rhetorical and Communication Research. Scenarios are a guide to work. It is not necessary to follow all the lessons. The teacher can decide which scenarios (or their selected fragments) are most useful for working with a specific group of students. The document offers the following lesson plans:

   1. Communication skills
   2. Express your scientific argument, not your opinion
   3. Build a valid scientific argument
   4. Searching for evidence
   5. Enhancing students' linguistic skills
   6. Rebuttal and refutation
   7. Fallacies

3. Methodological Guide for Teachers. ODYSSEY: Oxford Debates for Youths in Science Education

The final stage of preparation for debates based on specific packages is to familiarize students with the principles of debating, described in detail in the abovementioned document.

In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge

"In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge" educational package consists of the following elements:
• Multimedia presentation;
• Video-recording based on the presentation: https://youtu.be/EPlOyDXEMaU
• Educational package "In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge" - material for students;
• Worksheets (the same for all packages);
• "In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge" - material for the teacher (with answer key).
It is recommended to implement the package during a minimum of three lesson units.

Today, information is only a click away today. This also refers to scientific information which was very difficult to access previously, with experts in a certain field being scarce. Consequently, the Internet will make any form of education even more accessible in the nearest future, as the speed of data transfer and the cheapness of using the Internet increase. Not only is information easily available, but it is entering parts of the world where no one expected it only a few years ago.This does not only refer to "digested" scientific knowledge, but also to "raw" data which you use to draw conclusions and make discoveries you are looking for.

The presented educational package "In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge" includes an overview of online teaching, reliability of information found on the Internet, and the spread of pseudoscience. It also allows students to formulate arguments for and against the modes and aspects of using the Internet in education.

The debate on the resolution: "In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge" may take place both during extracurricular activities in the field of IT, psychology, as well as other subjects in the field of social sciences. The level of the materials is adjusted mainly to secondary schools.

Lesson 1. How do social networks and information technologies change the traditional approach to knowledge transfer and information dissemination?

Social networks are certainly not a novel topic for high school students. Although students use them to a great extent on a daily basis, a more in-depth insight is required into the technological aspects of new information technologies in order to understand how information is spread and transferred. In addition to its technological aspect, this topic is related to an increasingly prominent area - media literacy, especially with the younger population. Presenting arguments for and against, students will have the opportunity to expand their technical knowledge and connect it with numerous topics in the field of social sciences, such as credible transfer and acquisition of knowledge. This topic became quite prominent due to the situation caused by the COVID-19 pandemic, when educational systems were forced to teach partially or fully online.

It is recommended that students receive the materials a few days prior to the lesson. This will allow them to get acquainted with the topic of the lesson initially and facilitate active participation in the classroom. A multimedia presentation or a video recorded by the author of the package can be used during the lesson.

Lesson 2. „In the future, social networks and the Internet will be the best means for the dissemination/communication of knowledge" – constructing arguments for and against the resolution

The aim of the second lesson is to formulate as many arguments as possible (both for and against the resolution) that will be used by students during the debate, summarizing the work with the package.

Lesson plan

1. Organizational issues, checking the attendance list, familiarizing with the topic and objectives of the lesson [5 minutes].
2. Preparation of arguments [25 minutes]
3. The teacher divides the class into teams of two. Each team receives 8 question cards available in the educational package (materials for the student) and 2 copies of worksheet No. 1 (one for each student individually). Based on the questions, students formulate arguments for the presented thesis, against the thesis and those that are debatable and can be used in the discussion by both parties. Students work together, but each student individually completes his/her worksheet. There are examples of selected arguments for worksheet 1 are in the answer key.
4. Teams: proposition and opposition are formed [10 minutes].

Team selection may be executed in 2 forms, each of them having both advantages and disadvantages.

Students declare which arguments are closer to their beliefs. The teacher divides the class into teams (each with a similar number of students) in the manner reflecting their convictions. The second method assumes a division similar to the one above, with the difference that ultimately the team consisting of the supporters of a given resolution becomes the "opposition" team, while the opponents of the thesis become "proposition" team. The supporters of such a division assume that it teaches the participants of the debate to a greater extent to use arguments supported by facts, and is less based on emotions. Alternatively, division into teams can also be done randomly.

Finally, team selection can also be made by the teacher in a subjective way, ensuring that each team has both leaders and students who require more help, so that both teams have similar "winning potential". In order to save time for division, the teacher can do it at the beginning of the lesson, for example by distributing worksheets number 1 to the students, printed on sheets of different colour or marked in some other manner.

5. The teacher distributes worksheets number 2 to the students (one for each student) and explains the homework. An example of a filled out worksheet is available in the answer key.
6. Students in each team read prepared arguments in accordance with the assignment to a given group. Each student receives 1 argument, which he/she will develop (as homework) according to the guidelines in worksheet No.2.
7. Each team also appoints 3 people who will present the arguments prepared by the entire group. Students decide the order of their speeches. During the debate, other team members who are not directly involved in the debate, fill out worksheet.
8. Summary of the lesson, evaluation of students' work [5 minutes].

Lesson 3. Debate

During the final lesson, the teams conduct a debate according to the guidelines contained in the "Methodological Guide ..." It takes 45 minutes in total to conduct a full debate. During the debate, the teacher does not comment on the arguments or indicate the fallacies made by the students on an ongoing basis.

An exercise-based debate should be structured as follows:

1. Opening of the debate by the moderator/chairperson [3 minutes].
2. Initial vote by the audience [2 minutes].
3. 1 st Researcher-Debater of the A research-team: Constructive Speech [4 minutes].
4. 1 st Researcher-Debater of the B research-team: Constructive Speech [4 minutes].
5. Cross-fire between the researchers-debaters (1) of both research teams [3 minutes].
6. 2 nd Researcher-Debater of the A research-team: Rebuttal Speech [4 minutes].
7. 2 nd Researcher-Debater of the B research-team: Rebuttal Speech [4 minutes]
8. Cross-fire between the researchers-debaters (2) of both research teams [3 minutes].
9. Preparation time for the Summary and Final Rebuttal by both research teams [2 minutes].
10. 3 rd Researcher-Debater of the A research-team: Summary Rebuttal [2 minutes].
11. 3 rd Researcher-Debater of the B research-team: Summary Rebuttal [2 minutes].
12. Grand Cross-fire between the researchers-debaters (1 & 2) of both research-teams [3 minutes].
13. 3 rd Researcher-Debater of the A research-team: Final Focus Rebuttal [2 minutes].
14. 3 rd Researcher-Debater of the B research-team: Final Focus Rebuttal [2 minutes].
15. Final vote by the audience / Short written feedback [3 minutes].
16. Presentation of the results by the moderator [2 minutes].

If the debate takes place during extra-curricular activities, then it is recommended to devote, for example, 90 minutes for this part. This will allow you to prepare the room for the debate, recall the rules, conduct the debate and discuss its course and finally evaluate the work of students.

In terms of classroom conditions, it would be ideal to allocate two adjoining lesson units to the debate. Taking into account the school circumstances, organizational difficulties and the inability to devote too many lessons to content extending the core curriculum, the debate can be conducted in one lesson, while maintaining high discipline in time. In this case, it is recommended that during the next lesson with the class additional 10 minutes are spent discussing the debate, pointing to strengths and mistakes made by the participants of the debate.

In this format, 6 students (3 from each team) actively participate in the debate. The teacher may also appoint a moderator from among the students and a time keeper. The rest of the students will receive worksheet number 3. Their task will be to listen carefully to the debate and to note the opposing team's strengths and areas for improvement, and to justify their choice. Completed worksheet no. 3 may be the basis for issuing a grade for activity in the lesson for students who did not take part in the debate directly, but participated in its preparation and were active observers of its course.

Worksheet No 1 – answers

FOR	„GREY AREA"	AGAINST
Does the Internet make education more available? Not without reason, there is a popular saying that information is only a click away today. This also refers to scientific information which was very difficult to access previously, with experts in a certain field being scarce. We can easily conclude that the Internet will make any form of education even more accessible in the nearest future, as the speed of data transfer and the cheapness of using the Internet increase *Are advantages of distance learning visible in comparison with traditional modes of learning?* In the United States, the number of students attending some form of online teaching is growing by more than five percent each year. Online teaching, whether through programs such as Skype or through specialized Internet-based education platforms, brings enormous benefits such as a drastic reduction in student travel and accommodation costs, great comfort due to the unlimited options of places for the transfer and adoption of education, the maintenance of direct contact between teachers and students, and even the possibility of interaction between them any	*Does the Internet make knowledge available to everyone, not just the "elite"?* The availability of scientific evidence will thus lead not only to the geographical expansion of education, but also to the expansion of creative education and liberation from educational authorities. *Who is responsible for the content on the Internet?* Traditional system of editing and reviewing, typical for books and journals, is almost non-existent on the Internet. And where this process is present, additional checks are needed to determine the credibility of the system. *Has the Internet made education "cheaper"?* With digitization, the costs of transferring and publishing information have become negligible. I	*Is the information on the Internet reliable?* It is difficult to check the quality of online sources. Even the most popular and largest online encyclopedia, Wikipedia, is not an acceptable knowledge source, if we use it for scientific research and education. *Is the Internet fertile ground for pseudoscience?* The endless depository of data on the Internet is a perfect source of alleged supporting evidence for the most bizarre theories, but this does not only stand for pseudo-scientific conspirators, but also for experienced and renowned educators who can often abuse them for entertainment, selfish, psychological or other reasons. *What are the drawbacks of social networks?* the very format of social networks nurtures the echo chamber effect, where your voice echoes multiple

time and any place, whenever and wherever the need arises.

What is the response of reputable higher education institutions to online teaching?

An increasing number of top universities even offer their courses online for free, so top educational content will overcome political, spatial, temporal, and even class and socio-economic barriers.

Is the Internet suitable for the presentation of knowledge?

In the near future, virtual reality (VR) and augmented reality (AR) technology will bring unforeseeable opportunities for the presentation of educational content and the acquisition of knowledge, which is a big challenge for experts in the field of education.

Does the Internet support critical thinking?

You can check any information from your boring textbook on the Internet. It is a treasure trove of ideas that your teacher did not even think of. With the Internet we will finally be able to use our own heads!

times in the circle of your "friends" or "followers". Such a format of social networks jeopardizes the ability to realistically and objectively perceive reality, which is a precondition for knowledge acquisition, but also for breaking personal prejudice and, what is most dangerous, for adopting innovations.

Is the point of social networks for us to surround ourselves with like-minded people?

What these installations have in common is that they may serve as echo chambers at worst, where over and over one lends ear to repetitions of one's own conviction from fellow partisans.
The lack of new, extraneous, and competing expressions of opinion can motivate fragmentation in society, which is neither innocent — let alone beneficial.

Are there obstacles to knowledge on its way to students? And as for the communication over the Internet with people who possess knowledge - as many people, as many points of view there are and completely new and inconceivable perspectives. New knowledge will be able to enter even the most conservative and closed environments. It will break down barriers of ideologies and prejudice.		

Worksheet No 2 – examples of argument (pro)

Argument with reasoning	Foreseen rebuttals of the other group	Answers to rebuttals
The Internet will make all forms of education even more available in the nearest future. Not without reason, there is a popular saying that information is only a click away today.	Information found on the Internet is unreliable. It is difficult to check the quality of online sources. Even the most popular and largest online encyclopedia, Wikipedia, is not an acceptable knowledge source, if we use it for scientific research and education.	The Internet is a natural testing ground for critical thinking. You can check any information from your boring textbook on the Internet. It is a treasure trove of ideas that your teacher did not even think of.
		If you can't find an article, graphic or multimedia about it, you can meet someone who knows more about it and ask for more information. Technical innovations will become literally visible. The Internet helps to update education in the field of engineering and sciences, where knowledge is advancing the fastest
	The Internet is conducive to the expansion of pseudoscience. The expansion of pseudoscience is not limited only to phenomena such as conspiracy theories, but similar processes appear within the scientific community, and even in the so-called hard sciences and technical sciences. First of all, there is a psychological tendency of people to close themselves in exclusive groups and groups of like-minded people, which is much easier to display with the advent of the Internet.	And as for the communication over the Internet with people who possess knowledge - as many people, as many points of view there are and completely new and inconceivable perspectives. New knowledge will be able to enter even the most conservative and closed environments. It will break down barriers of ideologies and prejudice. It will destroy ideologies and prejudice. With the Internet we will finally be able to use our own heads!

		The Internet is an excellent medium for the presentation of knowledge. In the near future, virtual reality (VR) and augmented reality (AR) technology will bring unforeseeable opportunities for the presentation of educational content and the acquisition of knowledge, which is a big challenge for experts in the field of education.

Worksheet No 3 – examples of argument (con)

Argument with reasoning	Foreseen rebuttals of the other group	Answers to rebuttals
Information found on the Internet is unreliable. It is difficult to check the quality of online sources. Even the most popular and largest online encyclopedia, Wikipedia, is not an acceptable knowledge source, if we use it for scientific research and education.	The Internet is a natural testing ground for critical thinking. You can check any information from your boring textbook on the Internet. It is a treasure trove of ideas that your teacher did not even think of.	Traditional system of editing and reviewing, typical for books and journals, is almost non-existent on the Internet. And where this process is present, additional checks are needed to determine the credibility of the system. Even if teachers and students are able and competent to conduct such checks, the effect of speed of access to information on the Internet is jeopardized by the time required for checks.
		We will often find inconsistent and contradictory information in our searches. If it is at all possible to do the difficult forensic detective work of establishing the truth, the ease of accessing content on the Internet is largely nullified by problems with verifying the authenticity of the content.
	If you can't find an article, graphic or multimedia about it, you can meet someone who knows more about it and ask for more information. Technical innovations will become literally visible. The Internet helps to update education in the field of engineering and sciences, where knowledge is advancing the fastest	The Internet is conducive to the expansion of pseudoscience. The expansion of pseudoscience is not limited only to phenomena such as conspiracy theories, but similar processes appear within the scientific community, and even in the so-called hard sciences and technical sciences. First of all, there is a psychological tendency of people to close themselves in exclusive groups and groups of like-minded people, which is much easier to display with the advent of the Internet.

		What these installations have in common is that they may serve as echo chambers at worst, where over and over one lends ear to repetitions of one's own conviction from fellow partisans. The lack of new, extraneous, and competing expressions of opinion can motivate fragmentation in society, which is neither innocent — let alone beneficial. In line with the ever-growing information specialization and screening on the Web and in the media, with more or less cunning and finesse, one may construct profoundly individualized communication packages that filter annoying voices and incompatible noisy information out, that one doesn't care to listen to.