INTERNET SOURCE SECURITY AND MATHEMATICS: THE CREATION OF A WEBSITE

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Abstract

The World Wide Web (WWW) is the largest source of information for students during their study process. The internet has surpassed most libraries in terms of the amount of information available, but it has not surpassed libraries in terms of the overall quality of information provided. The WWW is easily accessible, and students are tempted to gather information without evaluating it; they spend more time searching for it and less time processing and organizing it. Faced with the lack of quality information online, users must be able to critically assess the quality of the information they use. The hypothesis of this paper is: Do students evaluate the accuracy of information sources about mathematics in the Albanian language during their study process, and how informed are they about the criteria that an information source must meet to be reliable? The paper includes both qualitative and quantitative methods of data collection, a questionnaire, and qualitative methods of data analysis and synthesis. It also discusses ways to improve the accuracy of existing sources and promote the creation of new, accurate, and reliable sources. The realization of a well-structured website with quality information based on relevant references is proposed a model of a reliable source for students and beyond.

Key words: information sources, digital resources, critical evaluation, criteria, methods, mathematics.

Abstrakt

World Wide Web (WWW) është burimi më i madh i informacionit për studentët gjatë procesit të tyre të studimit. Interneti ka tejkaluar shumicën e bibliotekave për sa i përket sasisë së informacionit të disponueshëm, por nuk i ka tejkaluar bibliotekat për cilësinë e përgjithshme të informacionit të ofruar. WWW është lehtësisht i aksesueshëm dhe studentët tundohen të mbledhin informacion pa e vlerësuar atë; ata kalojnë më shumë kohë duke kërkuar informacion dhe më pak kohë duke e përpunuar dhe organizuar atë. Përballë mungesës së informacionit cilësor online, përdoruesit duhet të jenë në gjendje të vlerësojnë në mënyrë kritike cilësinë e informacionit që përdorin. Hipoteza e këtij punimi është: A e vlerësojnë studentët saktësinë e burimeve të informacionit për matematikën në gjuhën shqipe gjatë procesit të tyre të studimit, dhe sa të informuar janë ata për kriteret që një burim informacioni duhet të plotësojë për të qenë i besueshëm?

Punimi përfshin metoda të mbledhjes së të dhënave cilësore dhe sasiore, një pyetësor dhe metoda cilësore të analizës dhe sintezës së të dhënave. Diskutohet gjithashtu për mënyrat për të përmirësuar saktësinë e burimeve ekzistuese dhe për të promovuar krijimin e burimeve të reja, të sakta dhe të besueshme. Realizimi i një faqeje interneti të strukturuar mirë me informacion cilësor, bazuar në referenca të rëndësishme, propozohet si një model i një burimi të besueshëm për studentët dhe më gjerë.

Fjalë kyçe: burime informacioni, burime dixhitale, vlerësim kritik, kritere, metoda, matematikë.

INTRODUCTION

Mathematics is the science and universal language that helps students understand and engage with the reality they live in. Both learning and school subjects can be found in mathematics [12]. It prepares students for their future roles in society through essential mathematical knowledge, reasoning and logic skills, problem-solving abilities, communication, modeling, and, most importantly, through the ability to learn independently throughout life. The information age has given students unlimited access to a wide range of resources to support their learning process. The WWW has become the most important source of information for pre-university students and beyond during their studies.

For the subject of mathematics, there are a variety of information resources in Albanian, including online books, educational websites, math-dedicated sites, video lessons, and other didactic materials. The fact that anyone can post anything on the WWW makes information often uncertain or incomplete. The ability to evaluate the accuracy and reliability of these sources is one of the biggest challenges that students encounter in this context. Online resources need to be assessed as a crucial step in any research process, whether it's for additional information on a specific topic or to complete an assignment. The research process should include the identification of reliable content.

The use of inaccurate or unauthorized information can cause misunderstandings and confusion, which can negatively impact students' understanding of mathematical concepts and their academic development. This project has resulted in the creation of a mathematics website, which provides scientifically accurate information using relevant references and following a logical progression of mathematical concepts. Artificial intelligence (AI) has made building a website much easier today. Machines, particularly computer systems, simulate human intelligence processes through AI. AI-powered applications and devices are capable of recognizing and identifying objects. Human language can be understood and responded to by them. New information and experiences can help them learn. Users and experts can receive detailed recommendations from them. Their ability to act independently eliminates the need for human intelligence or intervention.

ChatGPT aids us in creating a website by offering a detailed building plan and appropriate platforms for developing the domain and design. Determining the purpose and content of a website is the first step in building its according to ChatGPT (See [10] for more).We select a building platform, such as Wix or WordPress, for ease of use, or we construct from scratch using HTML, CSS, and JavaScript for greater control. After registering a domain name, we choose a hosting service, such as Bluehost or SiteGround. By customizing the design, we guarantee that the site is mobileresponsive and optimized for search engines (SEO). Finally, we evaluate the functionality and launch the site once it's ready.

PURPOSE

This paper is designed to analyze how students in pre-university education assess math information sources in Albanian language during their learning process. The goal of this study is to assess whether students have the necessary skills to distinguish between reliable and accurate sources and those that may be inaccurate or unauthorized. It evaluates the accuracy of several selected sources on mathematics in Albanian.

METHODOLOGY OF THE STUDY

The methodology employed is based on the utilization of data obtained through the research of various literatures that focus on the accuracy of internet sources, particularly in mathematics, how frequently these are used by students, and whether they acquire the necessary knowledge from these sources. Analysis, synthesis, comparison, and evaluation of questionnaire results are among the other methods used.

1.DIGITAL INFORMATION SOURCES AND THEIR USAGE SECURITY

1.1 Sources Of Information

In the context of education and the study of mathematics, the definition of information is as follows: Referring to [14] information is a group of structured and interpreted data used to support the learning and teaching process in the subject of mathematics. Mathematical theories, concepts, theorems, formulas, methodologies, and educational resources available in Albanian language are included to assist students in acquiring new knowledge and reinforcing existing knowledge.

Traditionally, books, periodicals, and newspapers were primary sources of information. Now, however, a wider variety of unpublished resources is capturing public attention. Effective information use depends on people's ability to understand their needs, acquire relevant information, and assess its quality. Today, a vast range of materials especially online varies significantly in accuracy and reliability, available in diverse formats such as text, images, and videos, accessible through various platforms. The quality of this information spans a broad spectrum, from very high to very low. For additional information, take a look at [3].

1.2 Digital Resources: Advantages and Disadvantages of Digital Resources

Any information or media that is stored or transmitted in a digital format, such as on a computer or online, is called digital resources. Text documents, images, audio files, and videos are all part of this. The importance of digital resources in academic research is growing, as they allow for quick and easy access to a wide range of information from various sources.

Digital resources: Websites/ Learning platforms/ Video tutorials/YouTube channels/ Online books/ Blogs/ Journals/ Mobile applications/ Educational games/ Online forums, etc.

Advantages And Disadvantages

Digital resources provide diverse research methods beyond those of print materials, allowing researchers to cross-check information for accuracy and relevance. They encourage interactive and creative engagement and are often more cost-effective than print resources. However, digital resources require internet access and compatible devices, which are not universally available. Verifying online information can be challenging, leading to potential inaccuracies or confusion, and digital materials may need to be supplemented by print resources to achieve a comprehensive understanding. (See [4] for more)

2. AAOCC ARE THE FIVE CRITERIA USED TO EVALUATE

AUTHORITY. When evaluating authority, consider the author's credentials,

including their education, publications, affiliations, and experience. Look for contact information, such as an email address or phone number, and check whether the author has been cited in other bibliographies. Additional information about the author may sometimes be found outside the document itself. It is crucial to differentiate between the actual author and those who may have published the work. For online materials from organizations, businesses, or government agencies, assess the authority of these entities and determine whether their information is objective and well-researched or biased toward specific goals.

ACCURACY. When assessing accuracy, consider whether the information is specific and if the scientific research methods are clearly explained and reproducible. Check whether sources are listed in notes or reference lists, and evaluate the reliability of those citations. Look for critical commentary and ensure that conclusions are based on verifiable research or current data. Accuracy is crucial for all research, especially concerning real-world events, where information should derive from observations and analyses. In the arts and humanities, while creativity is essential, documenting factual details such as names, dates, and places remains important. For websites, highquality writing, formatting, and grammar can enhance perceptions of accuracy; however, it is vital to verify the information against other criteria, as a professional appearance does not guarantee accuracy.

OBJECTIVITY. To assess objectivity, consider whether the source includes advertisements or donation requests that might influence its purpose. Evaluate whether the author presents multiple viewpoints and analyze the language for any provocative or biased elements. It is crucial to determine if the source is objective enough for your needs or if it exhibits bias. Scholarly research may contain biased perspectives, provided these biases are acknowledged and compared with alternative viewpoints or interpretations.

CURRENCY. Currency is crucial when evaluating sources, especially in the sciences, where developments occur rapidly. Always look for a date indication for the material. When assessing research results, consider both the publication date and when the research was conducted. For online sources, it's essential to ensure the information is current; check for a "last updated" note at the bottom of web pages. Keep in mind that this date may not reflect the actual publication date of the content. To accurately assess currency, verify three key dates: the last updated date, the publication date, and the date of the research or statistics cited.

COVERAGE. Check if the information source adequately covers the subject matter. Additional sources may be necessary to gain a more complete

understanding since the information covers only a portion of the topic. Examine how the coverage from one source is compared to other sources. For additional information, please refer to [5].

CREATING A WEBSITE

Due to the lack of reliable mathematical concepts information on Albanian websites, the idea of creating a website arose. The website contains scientific information that is accurate and detailed, initially focused on mathematics disciplines, and will be updated continuously. This work involved the creation of a website.

The steps we followed to create the website:

1. Our first task was to choose the name and logo for the website. Our name for the website is 'Copëzamatematike' (See [13] for more).



Figure 1 A brief welcome message section on the website's homepage. "Copeza Matematike is a unique platform that provides scientific information on various disciplines of mathematics and beyond. It offers an opportunity to delve into the expansive field of pure mathematics, presented in the Albanian language exclusively for you."

- 2. The domain was created on Bluehost.com, and the design was done on WordPress.com. (See [19],[20] for more)
- 3. The website's objective is to provide scientific information that is accurate and up-to-date.
- 4. The website menu was initially organized by mathematical disciplines and then categorized by the relevant topics of each discipline. This division and categorization is based on a lecture held last year on the subject of 'Mathematics in Secondary Education.'

5. The website is equipped with information about the author, the publication date of the information, and satisfies the AAOCC criteria. For additional information, go to [13].

RESULTS

1. THE EVALUATION RESULTS FOR "SPUTNIK.AL" AND "DETYRA.AL" ACCORDING TO AAOCC CRITERIA

Comparison with the foreign site "mathworld. wolfram"(See [16] for more), which meets the AAOCC criteria:

Author. The authors of both websites remain unidentified, and no credentials are provided. Although an email address is listed for contact, its ownership cannot be confirmed, leaving us without reliable information regarding the accuracy of the solved exercises. Knowing the authors' names is essential for proper citation in bibliographies. In contrast, "mathworld. wolfram" [16] offers detailed information about its authors, including their education and expertise, which enhances our confidence in the information presented.

Accuracy/Quality. "sputnik.al" [17] and "detyra.al" [18] are websites that provide exercise solutions, and each exercise is given a specific solution without any further information. Both websites have spelling and scientific errors. Neither of them has a bibliography included. The information has not been edited or reviewed by other peers, but there is no information on it. The sources used are not cited, so we cannot determine their reliability. Meanwhile, on "mathworld. wolfram," [16] all references for every topic and solved exercise are listed.

Objectivity. On "sputnik. al," [17] there are no published advertisements; the true purpose of the site is to provide solved exercises for the subjects presented. In contrast, "detyra. al" [18] has many published advertisements, which not only change the site's true purpose but also distract the readers.

Publication Time. Information on "detyra. al"[18] was published in 2020, while "sputnik. al" [17] does not have a publication date for its information. There are several unpublished pages that require completion and updating. Not only is the information outdated, but it also contains exercise solutions from books that are no longer part of the curriculum.

Coverage. The topic and exercise solutions are not adequately covered by the information. Therefore, readers may require additional resources to acquire a more comprehensive comprehension.

2. QUESTIONNAIRE RESULTS

A case study examining the safety of online mathematics resources in

Albania for 9th and 10th grade students at "Sevasti Qiriazi" School and "Raqi Qirinxhi" School. Students' learning process is greatly influenced by the quality and accuracy of information they receive from online sources. The lack of accurate sources and incomplete information can cause confusion. To understand its importance, a survey was conducted in the 9th grade at Sevasti Qiriazi School and in the 10th grade at RaqiQirinxhi School. The study had a total of 64 participants. The presentation can be found below.



Graph 1 Students' awareness of evaluating existing sources on the WWW is low, as indicated by the survey results. 18.42% of students who say they don't use online resources to learn mathematics, while 81.57% say they do. It is evident that the majority of students use online information resources to study mathematics.

39.47% of students answered in Albanian when asked about their preferred language on online resources. According to 7.89%, they don't use Albanian information resources for mathematics, but rather foreign languages. 13.15% reported using both Albanian and foreign languages. Therefore, the majority of people use Albanian resources, while those who are proficient in foreign languages are also able to search for mathematical information in those languages. Errors in the Albanian language regarding mathematics, while 53.12% of them reported that they have not encountered any errors. The critical eye they need to use when searching the internet is the cause of all of this. (Graph 2).





Regarding the accuracy and reliability of online sources, it turns out that the majority of students are less informed. This suggests that manyof them may be victims of inaccurate information, which may lead to the acquisition of incorrect information. For more information, see graph 3.



Graph 3 According to results,65.62% of students responded that they are not aware of the possibility of encountering inaccurate information on the internet, while 34.37% of them responded that they are aware.

The following results were obtained regarding the evaluation of the accuracy and quality of online mathematics resources in Albanian. The majority of students consider the content to be understandable and accurate. (Graph 4, Graph 5)



Graph 4 According to results, 21.87% of students rated the information about mathematics on the internet as accurate, 25% rated it as very accurate, 6.25% rated it as not accurate at all, and 46.87% did not respond.



Graph 5 According to results, 23.43% of students rated the quality of the information as understandable, 14.06% rated it as very understandable, 7.81% rated it as not understandable at all, and 54.68% did not respond.

The majority of students, 39.47%, prefer educational learning platforms, while the remaining prefers video tutorials, websites, and other online resources. Educational learning platforms are considered to be more reliable than other sources due to their coverage of more topics. Students cite YouTube, ChatGPT, Sputnik, Detyra.al, Wikipedia, Google, and websites as the resources they most frequently use.The evaluation criteria for online resources are not well-known to the majority of students, 81.57%, which

indicates a lack of awareness about their accuracy and reliability. Furthermore, 94.73% of them were not knowledgeable about the evaluation criteria. A presentation was created for each of these two classes to help them become more critical about selecting the information they use to learn mathematics. The criteria they provided were not accurate.

CONCLUSIONS AND RECOMMENDATIONS

- Finding reliable information and developing critical skills.
- 1. Students are taught how to talk about the information they need and how to obtain and utilize it.
- 2. Students should learn how to prepare information, including selecting appropriate sources, finding information, classifying and verifying it for accuracy, creating a class database, categorizing based on characteristics and purposes, and checking for spelling consistency.
- 3. Students should possess the basic skills of critical thinking to seek, evaluate, use, and create information to meet their personal, social, professional, and educational goals.

Students should be able to determine the type of information needed for a specific task and obtain it in a qualitative and effective manner.

For additional information, take a look at [2].

• Evaluating sources of information on the internet

Referring to [9] to identify the best sources of information, one should:

- 1. Assess the information obtained based on its accuracy, authorship, objectivity, purpose, and publication date.
- 2. Recognize the different kinds of information sources that exist.

Users should be able to critically evaluate the importance of all types of information sources before relying on them. Students should be familiar with two basic rules for searching for information on the internet, as mentioned in. (See [2] for more)

- 1. Acquire the ability to narrow down their searches.
- 2. Start identifying web pages that are useful.
- 3. Pick strategic websites by analyzing search engine results.

• Online Learning Resources and the Role of Teachers

Can educational materials online, contribute to the teaching of mathematics without the role of teachers, and how should (or must) the role of teachers changes from our traditional perspective when considering the internet as a learning tool? Research shows that when students access information through the internet without the effective role of teachers, the quality of learning that takes place will be very poor and result in little achievement. Many poor habits will be encouraged in the absence of teachers, such as plagiarism and accessing inappropriate websites. For more, see [6].

NCTM recommends that technology or the internet be utilized as a learning aid, but not as a substitute for teachers. It is important for teachers to guide students by observing their mathematical inquiry and reflecting on their progress and outcomes. Teachers can encourage students to express their mathematical inquiries and share them with their classmates when accessing information. For additional information, refer to [11].

- According to the questionnaire responses, students frequently utilize online sources in Albania. Most of them are not aware that online sources can be inaccurate and unreliable. The majority of students lack knowledge about evaluation criteria. Before using online information sources, it's crucial to evaluate them.
- The lack of effective teachers leads to poor learning quality and no results when accessing information through the internet.
- It is important to consider technology or the internet as a tool for learning, but not as a substitute for teachers. In order to avoid falling victim to incorrect information or inappropriate websites, the teacher should assist students in their search for information.
- In order to achieve their personal, social, professional, and educational goals, students must have basic critical thinking skills that allow them to search, evaluate, use, and create information.
- The evaluation of "sputnik. al" [17] and "detyra. al" [18] shows the poor quality of these websites for mathematics in Albanian. Websites that are not reliable for students to obtain information from due to spelling errors, scientific inaccuracies, the absence of authors, references, and publication dates.
- After presenting the criteria for evaluating information sources, which were unknown to 9th and 10th-grade students at the "SevastiQirjazi" and "RaqiQirinxhi" schools, they became more aware of future searches.
- It is important to further develop the creation and promotion of new high-quality and accurate information sources.
- "copezatematike.com" is a reliable information source that is accurate and reliable due to its appropriate references. (See [13] for more)
- copezamatematike.com's content is more credible because its menu is organized according to disciplines and topics in a logical flow. (See [13] for more)

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