

A Mixed Methods Action Research Project

In Understanding the Impact of the CORE Framework and Students' Abilities to Critically Analyze

Online Sources

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## Abstract

### A Mixed Methods Action Research Project

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The rise of social media and the information age has brought in new challenges for people. In this post-truth era where information is easily shared among people, it has become increasingly more difficult for people to know whether a source they are reading is legitimate or not. It is often assumed that students today are naturally versed in technology and so they should be ones that can overcome this problem. However, there is ample evidence that students struggle with identifying online information as being credible and reliable, or as misinformation or disinformation. This was certainly a problem within my own classroom as my students were often using the first couple of hits in the search engine for many research projects. This inspired me to implement the Critical Online Resource Evaluation (CORE) intervention, developed by researchers at Concordia University. This intervention's purpose was to teach students metacognitive and critical thinking practices when researching online sources by looking at source, context and content to determine a source's reliability and credibility.

This mixed methods action research study with grade 9 students had two main purposes: to investigate the impact of a CORE intervention on helping students identify credibility and reliability; and, to compare the pedagogical approach of CORE to the Origin, Purpose, Content, Values, Limitations (OPCVL) method used to analyze sources through the international baccalaureate program.

First, a pre-test and post-test design with a paired samples t-test was used to compare the results before and after the intervention and a significant improvement was noted for tasks involving evaluation directly. However, results from an information synthesis task were insignificant. Students written responses were also analyzed qualitatively for presence of evaluation justifications, which showed a 135% increase.

Second, the analysis of the pedagogical techniques was done by comparing the responses of a source analysis for a larger assignment using two OPCVL and two CORE methods. It was found that there was very little difference in the strength of these techniques, but more so that these methods varied in how they can be used in a disciplinary manner.

## Acknowledgements

I would like to express my heartfelt gratitude to many individuals who have supported me throughout my journey in completing this master's thesis, which began during a global pandemic and has finally culminated in the completion of my work. When I joined the Master's in Educational Technology, I hoped to acquire new skills and perspectives for my career as a teacher, and I emerged with far more than I anticipated.

Firstly, my deepest thanks go to my advisor, Dr. Julie Corrigan. Initially, I intended to complete an internship; however, Dr. Corrigan encouraged me to utilize the data I collected for a larger project and to pursue a thesis instead. Despite my initial apprehensions, she inspired me throughout the Master of Education Technology program and made me eager to take the numerous classes she offered. Her calming and reassuring presence during the thesis process was invaluable. She was always available to address my questions, meet with me to discuss various approaches to data analysis, and provide unwavering support. Dr. Corrigan made my graduate experience at Concordia truly fulfilling. Thank you for your patience throughout this process.

I would also like to extend my gratitude to Dr. Mitchell McLarnon. I never imagined that a single summer course in participatory action research would have such a profound impact on my perspectives regarding research and the ethics behind it. His passion for teaching and the diverse voices he brought in as guest speakers have greatly influenced my own approach to teaching. I have even attempted to persuade my school to invite these voices to engage with our student body.

Thank you, Dr. Steven Shaw, for stepping in on such short notice to be a part of my committee and for the flexibility you have shown as an educator and professional in the program. I am grateful to all of you for being a part of my evaluation committee.

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# Chapter 1: Introduction to the Research Topic

Social media has brought about a surge in the proliferation of fake news and alternative facts, fostering the rampant dissemination of misinformation across these platforms. This, in turn, has significantly influenced the shaping of societal opinions. Indeed, research has demonstrated that fake news spreads notably swifter than authentic news sources (Cinelli et al., 2021)

In this study, fake news can be defined as news articles that claim to be grounded in fact but deliberately contain false statements, often with the intent to inflame emotions, attract a larger audience, or deceive (Anderson and Søe, 2019). Misinformation, on the other hand, is the inadvertent dissemination of such false or misleading articles, often due to the reader's lack of awareness regarding the article's inaccuracies (Anderson and Søe, 2019).

Governments and educational systems are working together to combat this current information ecosystem. One way is through an improved digital literacy program that builds students' critical thinking skills in identifying before spreading potential inaccurate information further.

## The Current Climate

Due to the current information ecosystem we live in with the establishment of Web 2.0, youth need to become more critical of the sources and information they are reading online. The ability to critically analyze online information has become one of the most essential skills students can learn today (Forzani, 2019). Approximately 95% of teenagers have access to a smartphone, and nearly 45% of these teens state that they are frequently online (Korona, 2020. P 43). Some studies have demonstrated that many students need help identifying reliable and credible information. As an example, two-thirds of students could not tell the difference between news stories and ads (set off by the words "Sponsored Content"), and "[n]inety-six percent of students did not consider why ties between a climate change website and the fossil fuel industry might lessen that website's credibility" (Stanford History Education Group, 2019, p. 3). This has been further exacerbated by students' use of artificial intelligence in the classroom. The rise of artificial intelligence like chatbots has created a seductive allure for students, and they often perceive the text produced as credible and reliable (Cukurova et al., 2019; Lanarin, 2020). In fact, in the classes that I teach, students who have used artificial intelligence to find quotes from a novel through programs like chatGPT have been given quotations that are not actually in the novel. Thus, techniques like corroboration and understanding authorship are essential for students in this fast-moving technological environment (Walsh-Moorman et al., 2020).

Digital literacy is critical in defending the spread of misinformation on platforms that may cause damage in the real world. This is easily seen with the spreading of misinformation around the reliability of vaccines during the COVID-19 pandemic. Misinformation is defined as the inadvertent or unintentional spread of inaccurate information (Anderson and Søe, 2019). One study

demonstrated that misinformation can often spread faster than real news (Cinelli et al. 2021). With the rise of misinformation (Allcott et al., 2019) and the echo chamber effect (Sasahara et al., 2020) on social media, new pedagogical techniques must be tested to determine which improve secondary school student's ability to evaluate the online information they read daily. The echo chamber effect can be defined as an environment in which individuals participate while encountering beliefs that reaffirm or even amplify their preexisting beliefs due to only encountering repetitive information in what is essentially a closed system. This closed system is more perceived as it exists due to the fact the algorithm continues to share the same pages and groups posts that relate to the posts that you spend longer to read or "like." This can often lead to further political or social polarization (Cinelli et al. 2021). This echo chamber effect is prevalent in social media especially due to its algorithms that are tailored to the user.

Thus, this action research study evaluates whether and to what extent the Critical Online Resource Evaluation (CORE) intervention has improved secondary students' ability in identifying and analyzing online sources in my Quebec secondary classroom. CORE is an instructional intervention developed with Quebec teachers for Quebec students with the aim of helping students learn to evaluate more critically online information. This nine lesson intervention incorporates the Forzani (2019) lateral reading framework of analyzing content, source and context. It also evaluated which pedagogical techniques contributed most to engagement and understanding throughout the intervention. This intervention took place with Grade 9 students who are predominantly anglophone in a private school in Montreal.

# Chapter Outline

Chapter	Main Topics
Chapter 1: Introduction	<ul style="list-style-type: none"> <li>• Overview of the research problem: The proliferation of misinformation and its impact on online research.</li> <li>• Purpose of the study: Investigating effective digital literacy programs to help students critically assess online sources.</li> </ul>
Chapter 2: Literature Review	<ul style="list-style-type: none"> <li>• The Rise of Misinformation and Fake News</li> <li>• The Digital Divide and its impact on critical online research</li> <li>• Online Evaluation: Current Pedagogical Context</li> <li>• IB Curriculum's Relation to Source Evaluation</li> <li>• Context within Quebec's Educational System</li> <li>• Student-Centered Learning Approaches</li> </ul>
Chapter 3: Theoretical Framework and Pedagogical Techniques	<ul style="list-style-type: none"> <li>• Critical Online Resource Evaluation (CORE) Framework</li> <li>• The Origin, Purpose, Content, Values, Limitations (OPCVL) Method</li> <li>• The Role of Metacognition in Learning</li> <li>• Student-Centered Engagement Theories</li> </ul>
Chapter 4: Methodology	<ul style="list-style-type: none"> <li>• Overview of the Research Design and Procedures</li> <li>• Detailed Breakdown of Data Collection Methods and Analysis</li> <li>• Strand 1: Pre/Post Test</li> <li>• Strand 2: Assignment Analysis</li> <li>• Strand 3: Action Research Journaling</li> </ul>
Chapter 5: Results	<ul style="list-style-type: none"> <li>• Overview of Results</li> <li>• RQ 1: Effectiveness of CORE Intervention</li> <li>• RQ 2: Pedagogical Techniques Analysis</li> <li>• Pre-test and Post-test Results</li> <li>• Indicator Analysis</li> <li>• Email Scores Analysis</li> <li>• Student Justifications</li> </ul>
Chapter 6: Discussion	<ul style="list-style-type: none"> <li>• Interpretation of Key Findings</li> <li>• Comparison with Previous Research</li> <li>• Implications for Teaching and Pedagogy</li> <li>• Limitations and Future Research</li> </ul>
Chapter 7: Conclusion	<ul style="list-style-type: none"> <li>• Summary of Findings</li> <li>• Contributions to Knowledge</li> <li>• Practical Applications in Education</li> <li>• Final Remarks</li> </ul>

## Chapter 2: Literature Review

### Introduction to the Review

The purpose of this review is to have a better understanding of the current climate in how misinformation is circulated and what pedagogical techniques are effective in teaching students to discern this misinformation while using online sources. Within this literature a variety of studies were included that were quantitative, qualitative and mixed methods in their design. This allowed for a more holistic review. Understanding the current misinformation climate is particularly important as one USA study found that on average teenagers spend up 4.3 hours a day on social media alone (Rothwell, 2023). Socio-economic status is explored in this literature review due to the fact the participants in this study are from affluent background and have had access to technology throughout their education. This could have influenced the results of the study and the concept of the digital divide is explored further in the literature review. This review then goes on to look at the current pedagogical approaches to online source evaluation. It focuses in on the International Baccalaureate curriculum, due to the fact the participants in the study are part of the Middle Years Program in the IB curriculum, and how well it builds students critical thinking and analytical skills and why this may connect to online source evaluation. This approach is then compared with the CORE framework, examining how it might be used to further improve students' ability in online source evaluation.

Finally, because the study takes place in Quebec, this regional context is explored with regards to how Quebec students are doing with online source evaluation and what skills they are being taught.

## The Rise of Misinformation and Fake News

Social media's rise has led to instantaneous sharing of fake news and misinformation. These stories have become viral and continuously shared on social media platforms. One study found that 61% of people during the COVID-19 pandemic felt greater division among the population, which was 30 points higher than the previous year (Devlin et al. 2021). When people read misinformation, they often believe it and act on it, even when it is corrected (Abrams, 2021). The rise of social media has created an echo chamber effect due to the algorithms that social media companies use. An echo chamber is when people are fed the same information that coincides with their beliefs or past searches (Cinelli et al., 2021). Even when fact-checking is used, many people who have seen a news article confirming their beliefs become more entrenched due to the echo chamber created by these platforms' algorithms. The algorithm is built to continually show people what they have searched for in the past, which often coincides with the political beliefs of this person to keep the user scrolling (Menczer & Hills, 2020). It has been found that some of these misinformation groups have learned to use these algorithms by implanting key terms in their posts to gain more followers, creating a worse confirmation bias among the users who only see things that agree with their potentially inaccurate knowledge of a topic (Farinelli, 2021). Thus, students must be taught at a young age to critically evaluate these potential stories and identify when they are being misled so that the spread of

misinformation decreases and becomes less effective in dividing the population. This is especially important for teenagers who spend much of their time on social media and may be influenced by this inaccurate information. The students in this study have had access to technology at quite a young age coming from affluent households and are part of a school community where laptops and other devices are used regularly in the classroom.

## The Digital Divides

The digital divide between technology and digital literacy can be defined as the impact that socioeconomic status plays in the potential gap in a student's digital literacy ability and overall access to technology (Warschauer et al., 2004). A student's access to technology can significantly influence their digital literacy skills. Studies have identified the impact of low socioeconomic households on widening this digital divide because they have less access to technology at home (Becker, 2000; Ceviker, E, & Gezer, T. 2024; Sezgin, S. & Firat, M. 2024). This also includes the available funding available to schools and their ability to have all their students have devices in the classroom. One study found a clear correlation between a family's socioeconomic status, which is primarily related to parents' education and family resources, and a student's literacy levels (Warschauer et al., 2004). The digital reading communities a student has at home play a prominent role in their digital literacy skills (Chen, 2017). The digital divide can be divided between a technological divide (first level) and a skills divide (second level) (Ceviker, E. & Gezer, T. 2024). The technological divide is when youth have less access to devices and technology at home and at school; whereas the skills divide is the digital literacy skills that students learn through education in school or at home. (Lythreatis et al., 2022). The participants

in my CORE evaluative study are from higher socioeconomic statuses and are using technology throughout the school day, and so the technological divide does not apply to them, but the skills divide is relevant because despite my students having access to devices they ostensibly struggle with digital literacy skills and identifying what they read online is credible and reliable or is simply misinformation.

Many of these students of higher socioeconomic statuses have a "head start" in learning with these technologies, which gives them an advantage. However, it is essential to remember that households engage in various literacy practices and that these diverse practices are not seen as applicable in a school context. Furthermore, teachers underestimate low socioeconomic students' technological abilities because they assume this digital divide has a more significant impact than the research shows (Henderson & Honan, 2008). This "head start" is something that may impact the participants in this study and their overall ability in identifying accurate information online and whether they have been implicitly evaluating from a younger age. The participants in this study are students at a private school in Montreal with quite a high tuition in comparison to other private schools in the city. They have also been using devices in their classrooms since grade 1 as per guidelines of the school. This access to technology in an educational environment may give an advantage to these students in recognizing misinformation in online sources faster.

## Online Evaluation: Current Pedagogical Context and Approaches

One of the most critical skills that students need today is their ability to identify and evaluate the credibility of online information (Forzani, 2018). A Stanford History Education Group study found that students' web search strategies currently do not demonstrate critical thinking or lateral

reading. Lateral reading is looking at other sites when determining if a source is credible (Walsh-moorman et al., 2020; Forzani, 2018). This skill allows students to check on the author's credibility, whether the publisher may have firms funding the online source, and whether the online source includes corroboration. This study also found that two-thirds of students could not tell the difference between news stories and ads (set off by the words "Sponsored Content") and "[n]inety-six percent of students did not consider why ties between a climate change website and the fossil fuel industry might lessen that website's credibility" (Stanford History Education Group, 2019).

Most of these studies focus on the United States and parts of Europe. There currently needs to be a specific literature that has researched Quebec secondary students' ability to determine the credibility of a source. One study completed by Mittermeyer (2005) found that most Quebec undergrad students could not identify the criteria that are important when identifying credible online sources. Thus, for my study, the intervention was based upon a three-tiered framework developed by Forzani (2019) that includes evaluating the content, the source of information (author and publisher), and the context. The three-tiered framework is outlined as thus:

- Evaluating the content which involves assessing the accuracy of ideas presenting in the text.
- Evaluating the source which involves evaluating the trustworthiness of the source through looking at author and/or the publisher.
- Evaluating the context of the source which involves looking at things like the URL of the website or when is the publishing date.

When looking at each of these tiers, a student can then determine whether the source they are looking at is relevant to what they are trying to study, and, more importantly, whether the source is credible. Thus, this framework was created in hopes of helping students become more proactive judges by giving them a guide in assessing the information that is coming at them (Forzani, 2019). A team of researchers used this framework to develop lessons and build the skills for Quebec students. Then, the intervention was evaluated to determine whether it was effective in building the necessary skills in determining a sources credibility and relevancy.

When searching for sources, most students fail to evaluate their findings; instead, they click on the first one or two sources that appear, according to research on middle school, high school, and undergraduate students (McGrew & Byrne, 2020). When researching and browsing the internet, students must be taught how to assess sources critically and challenge what they find. According to McGrew and Byrne (2020), a good evaluator of sources asks three questions: "Who is behind this information?" "What's the evidence?" and "What do other sources say?" (p 461). Students can examine the source's authorship, publisher, and overall goals with the first question. For example, the Joe Rogan Podcast which is a talk podcast that brings in many political figures or "experts," often brings in guests who side with Joe Rogan's philosophy, which plays a role in his motivation to inform people. People who listen to this podcast often are victims of the previously mentioned echo chamber effect. The evidence questions allow students to analyze what is being said in the source material and what other sources this publisher uses to support their opinion. The final question forces students to look at other source material and understand a more holistic viewpoint of the issue they are looking at by researching all perspectives. This intervention used in my study, and the use of lateral reading, helped

students make progress in analyzing sources online and demonstrated that instructional objectives in digital literacy can lead to students developing more effective approaches to researching (McGrew & Byrne, 2020).

Furthermore, a study conducted by Marttunen et al. (2021) found that students often questioned the credibility of online resources but could not justify their reasoning (2021). Justification was also a struggle found in another study that proves students have some ability to identify the credibility of online sources but do not have the skills or critical thinking to explain why they do not think it is credible (Kiili et al., 2022). This is further demonstrated by a study that found that only around 20% of students could demonstrate limited ability to engage with a high degree of evaluation (Hämäläinen et al., 2021). One potential reason why students struggle so much with evaluation is that the skills or reasoning are not taught well enough or clearly to students (Forzani, 2018). Even though our students have more knowledge of media language, they still struggle to evaluate a source. It was found that 55% of students use the fastest search engine and 22% use the pre-installed one (Pérez-Rodríguez et al., 2019). Thus, the research shows that some students can identify online sources as potentially non-credible. However, they often struggle with explaining "why" this is the case, so further research must be conducted on what pedagogical techniques could be helpful for students to justify their thinking.

## IB Curriculum in Relation to Source Evaluation

The (IB) program is a well-respected curriculum that teaches global-minded students who exemplify risk-taking and critical thinking (IB History, 2015). This program is currently used at my school, the setting of the current study. Within the humanities curriculum, there is already a source analysis tool that is taught to students when assessing the "values and limitations" of a source by looking at its "origin, purpose, and content" (IB History, 2015). IB students thus have more tools taught to them so they can counter the spread of misinformation with their critical thinking. One study found that students in the IB program were often better at using their critical thinking when identifying "fake news" than California state school students (Horn & Veermans, 2019). The IB curriculum is also one that post-secondary institutions will regard in developing students to become world thinkers and incorporating a metacognitive approach to their learning (Hill & Saxton, 2015). Its ability to build these metacognitive practices often helps students look at multiple perspectives when studying a topic and build the skills necessary to avoid becoming close-minded to one idea, but rather analyze all perspectives and students will use them to justify their reasoning behind a topic they studied (Gazda-Grace, 2002). There has been little research on how the IB curriculum, and specifically the use of the OPCVL method, has had an impact on a students' ability in analyzing online sources. The primary purpose of this method is taught in the history classes of the IB method and is a major question on the "paper 1" exam of the IB diploma (Grades 11/12) history course. It is taught as an important skill that historians use when understanding a historical event, interpreting historiography of an event and eventually whether to use this source as a form of evidence in supporting an argument.

It is my hope to try and see if the OPCVL method taught in the IB Middle Years Program (MYP) can then be used as a form of online source evaluation.

## Quebec Context

There has been very little research completed in the Quebec context of a student's ability to evaluate online research. There was one study that focused more on first-year university students, and it was found that students needed to be more prepared in evaluating online resources, and only 23% of students were able to identify credibility indicators. These indicators include things like currency (date), authorship, and site sponsorship (Mittermeyer, 2005). Other than this one study, there have been no other interventions that have been used in the Quebec context. The Quebec government has begun to develop resources for teachers, but these resources have had no empirical validation on their effectiveness in building evaluation skills. Online evaluation has been taught in a variety of ways globally, but seems to follow a similar trend of teaching students how to identify authorship and currency of the sources (McGrew & Byrne, 2020; Horn & Veermans, 2019). Ultimately, this intervention and study hope to address a gap in research specific to Quebec secondary school students.

The Quebec context has been focused on studies in relation to university students but one recent study has been completed for the Quebec high school context through the 3-tiered framework (Corrigan et al., 2023). Finally, this would be the first focused study to analyze the Quebec IB student and how they learn source analysis and its effects on their ability to critically identify the reliability and credibility on online sources.

The Quebec Education Program has also recently developed a digital literacy framework to be incorporated into classrooms. The title for this framework is the *Digital Competency Framework* (2019). Its main objectives is to promote ethical digital citizenship and building the skills necessary for students to operate in a continuing progressive digital world. Ethical digital citizenship is focused on building the critical thinking skills of students when accessing online information by understanding “commodification of digital information” and “being aware of the impact of the use of digital technology on one’s physical and psychological well-being.” (Digital Competency, 2020, p. 9). There is also a digital competency dedicated to “developing critical thinking with regard to the use of technology” which is partly focused on “deliberately developing one’s critical judgement regarding digital technology” and content (p. 30), there clearly has been steps by the Ministry of Education of Quebec to be more explicit in the teaching of the necessary skills to be more active critical thinkiner when accessing online information; however, these competencies have yet to be fully ingrained into the curriculum of specific courses and each school can apply these competencies in any way they choose as there is no government oversight on how these competencies have been introduced into each individual school.

To focus in on the IB schools within the Quebec context would be very difficult as there has yet to be published research on this specific context.

## Student-Centered Learning

The school I currently work at values a student-centered approach to learning. Student-centered learning is an educational process that puts the student at the center of the learning that

focuses on the needs and abilities of individual students that promotes active engagement, critical thinking and independent learning (Baysal et al, 2021). Student-centered learning can look many ways, such as, gamifying the classroom (Öncü & Bichelmeyer, 2020), using a flipped classroom approach (Miller, 2012), and simply allowing students to interact with material individually or cooperatively with minimal teacher guidance in the beginning like the CORE lessons. It was effective in the town hall lesson where students were given roles and a topic and had to research and learn the role they had to play for a debate. Some guidance was given at the beginning of the lesson, but the rest of the townhall was ran through student engagement and debate. The town hall lesson many students noted as their favourite and had most of the class on task. This approach to learning has been found to be very successful in building engagement and overall academic success any a multitude of studies (Emanet & Kezer, 2020; Peabody, 2011; Öncü & Bichelmeyer, 2020; Baysal, Mutlu, and Nacaroğlu, 2023). A student-centered approach is meant to take away the focus from the teacher and give the flexibility to students in their own learning. It has a meaningful impact on the affective dimension of learning in lowering anxiety and attitude towards school which does have an impact on academic success (Emanet & Kezer, 2020). By giving the students a sense of autonomy and chances to collaborate with their peers, it was found in meta-analysis by Baysal, Mutlu, and Nacaroğlu (2023) that this led to more ownership in the student's learning and thus led to higher levels of engagement with the class material as quite often the student-centered approach also made the topic they were learning more relevant and applicable to their daily lives. It is certainly seen in many of the lessons within the CORE intervention as it uses current events and sources, as well as topics, that are very relevant to my students. Thus, the student-centered approaches used in the lessons should have a

positive effect on student engagement and ultimately show improvements from the pre-test to the post-test in their ability to analyze online sources. This study will evaluate whether or not this pedagogical approach to building these online evaluation skills is effective. Many of the students in this study are used to a student-centered approach as the IB curriculum is a large supporter of building the skills necessary for students to be driven individually and work collaboratively with their peers. In fact, these qualities are built into the “IB Learner Profile.”

**Figure 1: IB Learner Profile**

# IB learner profile

**The aim of all IB programmes is to develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet, help to create a better and more peaceful world.**

**As IB learners we strive to be:**

<b>INQUIRERS</b> We nurture our curiosity, developing skills for inquiry and research. We know how to learn independently and with others. We learn with enthusiasm and sustain our love of learning throughout life.	<b>OPEN-MINDED</b> We critically appreciate our own cultures and personal histories, as well as the values and traditions of others. We seek and evaluate a range of points of view, and we are willing to grow from the experience.
<b>KNOWLEDGEABLE</b> We develop and use conceptual understanding, exploring knowledge across a range of disciplines. We engage with issues and ideas that have local and global significance.	<b>CARING</b> We show empathy, compassion and respect. We have a commitment to service, and we act to make a positive difference in the lives of others and in the world around us.
<b>THINKERS</b> We use critical and creative thinking skills to analyse and take responsible action on complex problems. We exercise initiative in making reasoned, ethical decisions.	<b>RISK-TAKERS</b> We approach uncertainty with forethought and determination; we work independently and cooperatively to explore new ideas and innovative strategies. We are resourceful and resilient in the face of challenges and change.
<b>COMMUNICATORS</b> We express ourselves confidently and creatively in more than one language and in many ways. We collaborate effectively, listening carefully to the perspectives of other individuals and groups.	<b>BALANCED</b> We understand the importance of balancing different aspects of our lives—intellectual, physical, and emotional—to achieve well-being for ourselves and others. We recognize our interdependence with other people and with the world in which we live.
<b>PRINCIPLED</b> We act with integrity and honesty, with a strong sense of fairness and justice, and with respect for the dignity and rights of people everywhere. We take responsibility for our actions and their consequences.	<b>REFLECTIVE</b> We thoughtfully consider the world and our own ideas and experience. We work to understand our strengths and weaknesses in order to support our learning and personal development.

**The IB learner profile represents 10 attributes valued by IB World Schools. We believe these attributes, and others like them, can help individuals and groups become responsible members of local, national and global communities.**

Note. Reprinted from *IB Learner Profile*, by International Baccalaureate Organization, 2018, retrieved from <https://www.ibo.org/benefits/learner-profile/>. Copyright 2018 by International Baccalaureate Organization. Reprinted with permission.

Ultimately, it was interesting to find whether the student-centered approaches to the CORE framework in a Quebec IB classroom where students have been exposed to this style of learning before will continue to be a successful pedagogical approach in improving their ability to assess and critically analyze online sources using the 3-tiered framework.

## Purpose of the Study

As an educator in the social sciences, many of my students are having to do research for projects. In my own experience, when I quested my students, they often felt the first one or two sources were sufficient and reliable enough to use as research without evaluating whether it was credible. The quality of the research that is being completed for projects I have assigned to students in grades 9 to 12 has continued to see a decline. Many of my own students are not using the necessary skills while being critical about the resource they have found online, and instead have picked the easiest or first source they find that fits with their perspective. Often these sources have no author, and the information is vague and lacks corroboration. From my perspective as a teacher, most secondary school students struggle with understanding the credibility and reliability of the sources they are researching. I decided I wanted to implement a new intervention created by Concordia researchers (Corrigan et al. 2023) to help build the necessary skills for my students in evaluating online research, and so I have taken on an action research project to analyze whether this intervention is feasible with

my high school students and whether it can help build these integral skills for life. With the gap in the research related to the Quebec context, I examined the use the CORE intervention and OPCVL method with my own students in order to determine if these are viable pedagogical techniques that have a significant impact on my students' abilities in evaluating online sources. If it is viable, then these techniques could be further researched with other classes in the Quebec context.

## Rationale

Many studies have analyzed students' ability to determine whether online information is credible and reliable (e.g., Forzani, 2016; Hämäläinen, 2021; Stanford History Education Group, 2019). The CORE method of evaluating credible online information was described by Forzani (2019) as a means to improve in students' ability to determine whether the information they are using is valuable and reliable for what they are studying. While the Forzani article was conceptual in nature, this study evaluated a CORE instructional intervention further through an action research study with secondary students in a private school. This action research study described the different pedagogical methods that seemed to work best for the students throughout the intervention, rather than focusing on just one method like most studies have done (Hämäläinen, 2021; Horn, & Veermans,. 2021; Lai et al, 2018; Marttunen et al, 2021; McGrew, 2021; Pehlivanoglu, 2021). This is also a unique study for Quebec students where little research on students' online evaluation skills has been conducted. Thus, this study identified whether instructional interventions, including CORE and OPCVL, have had a significant influence on my students and their ability to evaluate online sources' credibility and

reliability. It further investigated how CORE and OPCVL can be used in building the skills necessary for students to avoid their own confirmation bias when doing online research.

## Chapter 3: Pedagogical Techniques

This study draws from four specific theoretical frameworks. Firstly, the study followed the theoretical framework of Critical Online Resource Evaluation (CORE) (Forzani, 2019). Second, it drew from the Origin, Purpose, Content, Values and Limitations method (OPCVL) used worldwide across the IB program. Thirdly it drew from theories of student-centered learning and engagement. Finally this study was guided in metacognitive theory; although it was not explicitly analyzed, many metacognitive practices were used in the intervention. This study used these theories of learning to understand how students engaged with and analyzed the credibility of online information.

### Critical Online Resource Evaluation

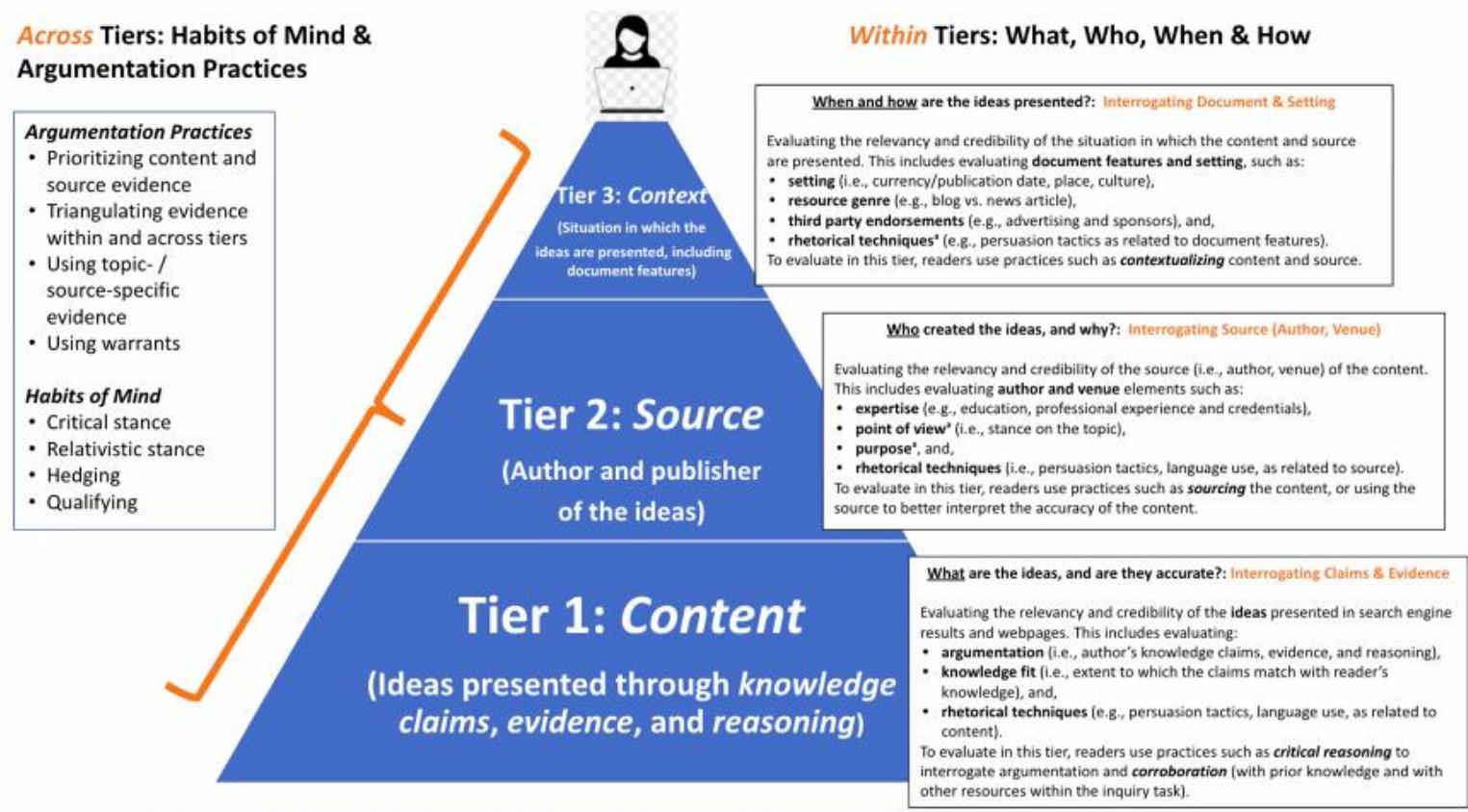
The CORE framework was designed to support students in evaluating the credibility of online information. Kiili (2008) defines credibility as the accuracy of that information. This has become especially relevant with online literacy as it engages with the youth daily through social media. Thus, this study focused on evaluating these new forms of literacy in online research (Leu et al., 2013). The CORE intervention in this study involved a multi-step process: 1. defining questions and locating information, 2. synthesizing, 3. evaluating, and 4. communicating information (Corrigan et al. 2022).

The CORE lessons developed by Corrigan et al. (2022) is the primary intervention used in this study; however, different pedagogical techniques can work in building the skills necessary for students

to evaluate critically. This study will evaluate a CORE in tandem with IB programme instructional methods.

**Figure 2:**

*An Elaborated CORE Framework Illustrating the Practices Used by More Effective Evaluators*



CORE Framework Based on the 3-Tiered Framework (Forzani et al. 2022).

Firstly, the CORE method is based on Forzani's 3-Tiered Framework for evaluating online information's relevance and credibility (Forzani, 2019). The guide in Figure 1 shows the general questions that were used to identify each indicator of content, source and context. Relevancy evaluation is focused on whether the research is related to the question the researcher is asking, and credibility evaluation is defined as whether the information that has been received is accurate (Kiili, Laurinen, & Marttunen, 2008) and if the source this information is coming from is trustworthy. Within this framework, "the more trustworthy and accurate the source is, the more credible it is" (Forzani, 2019, P 402). This framework breaks down the evaluation into three tiers: evaluating the content, evaluating the source, and evaluating the context of the source. Evaluating the content focuses the students' attention on looking at the accuracy of the information, how well it is corroborated and supported by credible evidence (e.g., evidence from a research study published by a credible author/organization). This might involve checking the primary sources of the evidence reported in an article to ensure that it was reported accurately.

Evaluating the source is looking at where the information comes from, which can be the author or publisher, including the author's purpose for writing the text (e.g., to persuade, to sell, to inform), as well as any conflicts of interest which could lead an author to bias in reporting information. An example could be a major beef lobby organization choosing to fund an article writing about the potential health benefits of eating red meat. Finally, evaluating the context of the source focuses on analyzing the trustworthiness of the context, which can include the website URL, how it is presented, and the currency of information (Forzani, 2019). These three tiers are the primary skills that are taught in the intervention through the CORE method. As seen in Figure 1, the three tiers are then

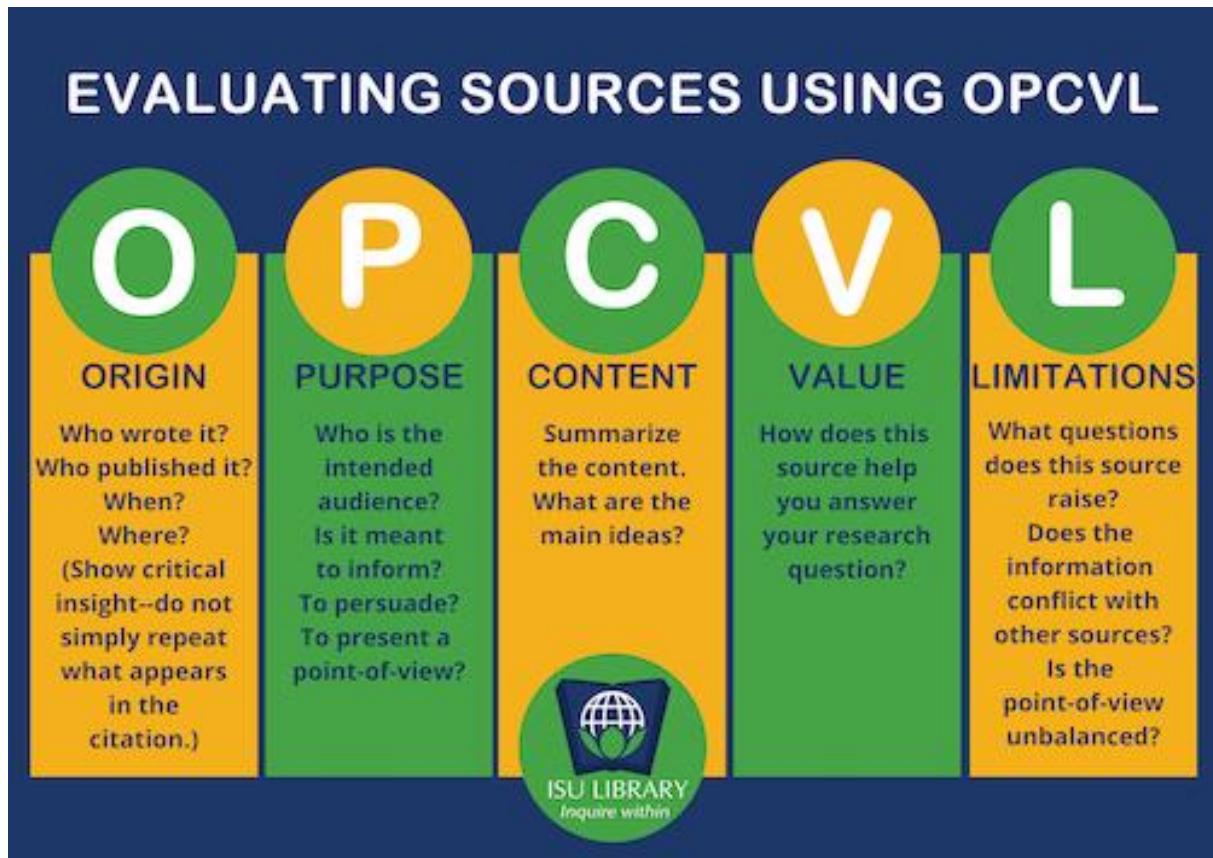
used in the overall process of locating the information, then evaluating that information using the three-tiered approach, then drawing a conclusion on the relevancy and credibility of that information, and finally choosing to synthesize it to support a student's opinion, for example, in an argumentative essay. Ideally, students will then use these skills in their day-to-day life and apply this framework implicitly when looking at any online information. Students will be taught the three tiers of analysis separately throughout the intervention and then will be evaluated how often they connect their justification of a credible source to those three tiers.

## Origin, Purpose, Content, Values, Limitations (OPCVL)

The IB method of evaluating sources follows a similar framework but is more general and breaks down a source into three main parts, seen in Figure 2. This method is referred to as the OPCVL method (IB History Curriculum, 2016). Students are meant to assess the value (V) and limitations (l) of a given source by referring to the origin (O), purpose (P), and content (C) of a source. The document's origin is focused on the author, currency, and publisher or website. The document's purpose is to look at the nature of the document and the "why" this source has been written. The content is focused on what is in the document itself. This includes what evidence is used by the author or what simply is being stated in the document itself. Students are then asked to determine what value this source holds and what limitations it may have when trying to answer their research question (IB History Curriculum, 2016).

**Figure 3**

*The International Baccalaureate OPCVL Method Breakdown*



*Approaches to learning: Research and writing at ISU: Evaluating sources. (2023, April 23).*

*International*

*School of Ulaanbaatar. Retrieved August 6, 2024, from*

*<https://isumongolia.libguides.com/atlresearch/evaluatingsources>*

The reason for having this method included is due to the students having already taught this method since grade 7 and there are some similarities of this technique to the three-tiered framework. The origins and purpose section of the IB method do align themselves well with the source evaluation of the three-tiered framework. Both want students to look at the author, why this source was written and what rhetorical strategies or point of view is used in the information. The content section of the

IB method also aligns itself very well with the content section of the three-tiered framework. Both methods teach students to identify what is being said in the text itself, what evidence is the author using to corroborate their arguments, and finally whether the argument they are using are sound. The biggest difference between these two frameworks is the use of the context in the three-tiered framework. The overall currency of the information is still used in the IB framework, but the context in three-tiered framework goes into much further detail by analyzing the overall structure, presentation and the URL of the online source. This could be because the IB method is primarily used to teach students to do historical source analysis rather than online information as well, and so it is up to the teacher if they choose to make the students use the OPCVL method when doing their research for assessments. Finally, the values and limitations ask the students what they may find valuable about this source, usually from a historian's perspective, but can be used for their own research too, and what potential limitations does this source have when studying a topic. This is also done within the three-tiered framework in figure 1 when evaluating the source, drawing conclusions and finally synthesizing it into an argument. Students will analyze two online sources using the OPCVL method and trying to see how flexible this pedagogical method is in allowing students to determine the reliability and credibility of the research they are completing by reading laterally.

## Metacognition

These skills are all important for students to be able to evaluate the credibility of online information, but also building "metacognitive practices" (Global Metacognition, 2021) is vital for the

students to learn to fight against confirmation bias (Pennycook and Rand, 2019) and echo chambers they may face. These metacognitive practices are crucial to self-correcting while learning through the taking in of information. Ultimately the goal of these metacognitive practices is concerned with accurate learning and so students must learn to question themselves throughout the learning process by monitoring, evaluating and regulating (Global Metacognition, 2021). When these practices are built in students, they will be able to self-regulate their learning when looking at any new information and identify their cognitive biases. Students must develop critical thinking skills to avoid getting trapped into only searching out things that agree with their own beliefs. Thus, through the CORE method, flexible thinking is a primary method to help develop this, which has to do with one's ability to change one's mind if faced with better reasoning and corroboration of ideas (Tseng et al., 2020). Furthermore, critical thinking skills and building multiple perspectives with a world approach are key parts of the IB program for students (Hill and Saxonm, 2015; Gazda-Grace, 2002). Within the IB program, students are encouraged through different teaching practices to take a global perspective when doing research and studying sources. This metacognitive practice is done further through the Theory of Knowledge (TOK) course, where students take an epistemological approach to understanding how they understand or know certain subjects. Although the TOK is primarily a Grade 11 and 12 program, the tenants are meant to be taught throughout the program (Gazda-Grace, 2002). These pedagogical techniques should help build students' abilities in critical thinking and use the evaluation techniques further to determine the credibility and reliability of online sources. Both the CORE and OPCVL methods apply the use of metacognition by forcing students to read laterally and

going beyond just looking at the source for what it is, but really question why they think this source may be credible for their research.

## Student-Centered Engagement

Student-Centered lessons were used throughout the intervention process as this form of learning has demonstrated success in building engagement and improvement in academics in a variety of studies (Cornelius-White, 2007; Edens, 2000 Hannafin, M. J.; Hannafin, K. M. 2010). As noted in in Hannifin's study (2010), an important part for student-centered learning to be a success, metacognitive skills must be also taught and this why many of the lessons in the intervention promote students to answer questions about their learning during the end of the lesson. This reflective practice helps build these metacognitive skills that are important within any student-centered learning.

Student-Centered learning encompasses strategies that shift the learning from the teacher to the students (Jones, 2007). These strategies can vary greatly, but the ones employed in the intervention has some opportunities for problem-based learning; which is when students are given a problem and must work collaboratively to find the solution to that problem. The most popular lesson used a townhall approach where students roleplayed a particular interested party and had to use sources to create a claim about the topic that was assigned. This lesson allowed students to research and use evidence to support their assigned role, and in some cases forced some students to try and argue an approach that they may not agree with personally.

Ultimately the theoretical approach of student-centered learning can help build engagement in students and so this approach was studied using the action research journal.

In conclusion, metacognition is very much the base of these two pedagogical techniques of completing lateral reading. Firstly the CORE intervention will be studied in its ability to strengthen the students lateral reading when completing online research. Secondly, their already backed up understanding in lateral reading with OPCVL will then be studied on its flexibility with using it for researching online. Finally, the journalling will be used to determine which lessons seemed to be engaging for the students which may give further insight on how the CORE intervention is being used from lesson to lesson, and which style of lessons may be better suited for teaching these lateral reading strategies that could be applied in either OPCVL or CORE teaching.

## Chapter 4: Methodology

### Overview of Design and Procedure

This study used a mixed method action research approach. A mixed methods approach allows for a more pragmatic quantitative data analysis by triangulating my quantitative results with qualitative reasoning (Johnson & Gray, 2010). The study included a within-groups pre-test post-test quantitative quasi-experimental design and the use of a thematic analysis of the qualitative data received from the tests and the students' assignments (Dawadi et al., 2021). Individual Action research was also employed to find pedagogical techniques that can be used to help with the gaps in digital literacy education when evaluating online sources. Action research can be a helpful method in identifying what works well in a local context, such as a classroom, and can be applied more institutionally (Stringer, 2013). Individual Action research, specifically, is action research that is intended for the researcher to find a better way to solve an identified problem (Bourke, 2008; Capobianco & Lehman, 2006).

The original digital literacy program was created with the involvement of active educators in Quebec, thus incorporating some of the theories behind participatory action research (PAR). The participants in this case were the teachers, including me, who worked with the researchers to develop the CORE lessons. (Johnsen & Christensen, 2014). The feedback received was used to revise and improve the program (Corrigan, 2022). My study is part of a larger and more extensive study for the

Ministère du l'Éducation du Québec that secondary school educators can use in classrooms to help build digital literacy skills for analyzing and evaluating online resources.

My class, which is a grade nine history class located in a private school in Montreal, has been chosen for the intervention. Firstly, my students were responsible for completing a pre-test evaluation of their ability to analyze and choose credible sources on whether red meat should be added to the school cafeteria menu.

Once the pre-test was complete, eight more lessons were covered on the skills that were necessary to evaluate the credibility of online information. The skills taught followed the three-tiered Framework of context, content, and source (Forzani, 2019). At the end of each lesson, students completed an exit ticket, which is a quick end-of-lesson check for understanding, based on their learned skills. I also completed a short reflection with guided questions based on my observations of the lesson in a teacher's journal. In the final lesson, students completed a post-test in a similar format to the pre-test. They chose what credible sources to use when deciding whether the school cafeteria should have artificial sweeteners in their food. Finally, after the post-test, students were given a culminating activity that would be graded for the report card to incorporate the learning of their curriculum and the intervention to make comparisons. This culminating activity students had to pick an event in history and argue why they believed it to be the most significant event in history. One aspect of the grade was attached to them analyzing the credibility of four sources in their bibliography. Students then had two use the CORE method to analyze two sources and the OPCVL method to analyze two sources. This was the main part of the assignment that would be analyzed. By having it graded, there was hope that this would potentially serve as a motivator for the participants to put forth

their full effort as grades are highly motivating for the participating students at the school. At the end of each lesson, I recorded my reflections on the lessons in a teacher's journal. Teacher journals help identify any concerns with the interventions and find problems I encounter with evidence-based practices (Yu et al., 2015).

An overview of the methodology is in table 1 below as well as a summary of the flow chart on the overall procedure of the study. Each strand will be explained in greater detail later in this chapter.

**Table 1**

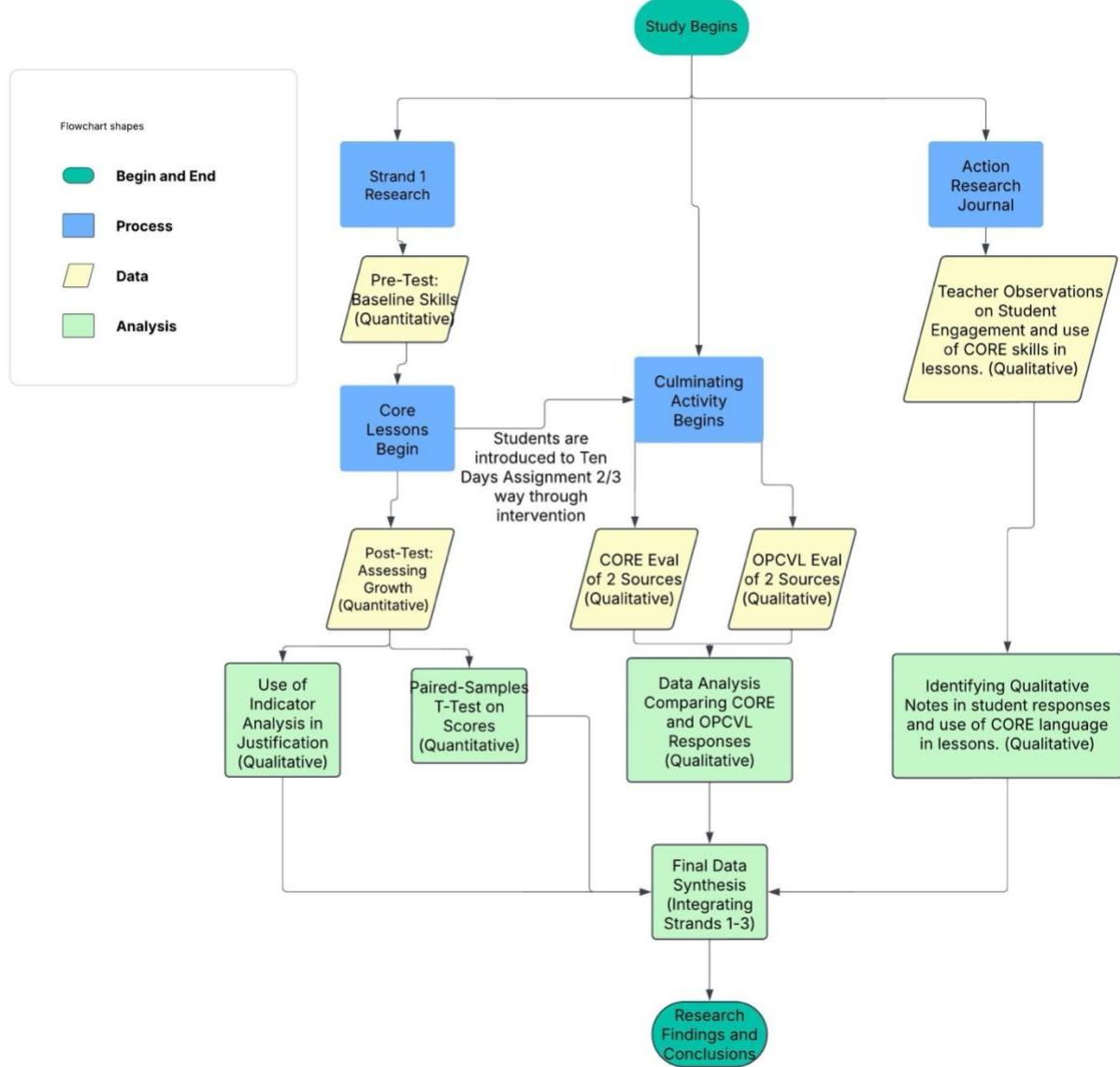
*Summary of Methodology*

	Strand 1	Strand 2	Strand 3
Research Question	Research Question 1	Research Question 2	RQ 1 & 2
Sample	Grade 9 Students n=10	Grade 9 Students n=10	Teacher Notes
Instruments Apparatus Data Collection	Pre-Test and Post-Test Data. <ul style="list-style-type: none"> <li>• Correct Identification of Unreliable Source</li> <li>• Justification Scores</li> <li>• Email scores</li> </ul> Qualitative Data <ul style="list-style-type: none"> <li>• Justifications of choices for most to least reliable source.</li> </ul>	"Ten Days that Shook the World" assignment annotated bibliography <ul style="list-style-type: none"> <li>• 2 sources analyzed by CORE Method.</li> <li>• 2 sources analyzed by OPCVL method.</li> </ul>	Action Research Teacher Journal and Field Notes on student engagement and overall use of CORE language in class activities. Special notes were made of student attendance.
Methods	Qualitative and Quantitative Analysis	Qualitative Analysis	Action Research Qualitative analysis.
Analysis	<ul style="list-style-type: none"> <li>• Paired-Samples T-Test on pre and post-test results.</li> </ul>	<ul style="list-style-type: none"> <li>• Coding of student's responses by content, source and context.</li> </ul>	<ul style="list-style-type: none"> <li>• Cross-referenced journal observations with student assessment</li> </ul>

	<ul style="list-style-type: none"> <li>• - Student justifications were categorized into superficial (0-1 points) vs. detailed (2-3 points).</li> <li>• - Coding framework based on Forzani's model (analyzing content, source, and context indicators).</li> <li>• Trends identified in how students improved in evaluating digital sources.</li> </ul>	<ul style="list-style-type: none"> <li>• Student analysis was categorized into superficial (0-1 points) vs. detailed (2-3 points)</li> <li>• Qualitative Comparisons were made between CORE and OPCVL justifications to assess how students adapted each framework.</li> </ul>	<p>data (Strand 1 &amp; 2) to reinforce findings of students' ability in applying CORE method in a variety of lessons.</p>
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## Research Design and Procedure

The design and procedure of the study is outlined in below in Figure 4 as a flow chart.

**Figure 4***Flow Chart Summary of Procedure*

## Research Questions

The purpose of the study was to implement an intervention that can work to help improve my students' abilities in analyzing an online source's credibility and reliability within a grade 9 history

classroom. The goal was that the CORE intervention would improve my students' abilities in assessing the context, content and source, and eventually synthesize this analysis when making claims on topics they are studying. The pedagogical approaches that were used in the intervention will also be analyzed as student-centered and experiential processes were used in many of the lessons in the intervention.

The following research questions will be studied:

1. How and to what extent did the CORE intervention improve the student's ability in critical online research?
  - a. How did the quality of students' written justifications change from pretest to posttest?
2. What pedagogical approaches can be used to teach students critical online researching skills? .
  - a. How did students apply the CORE and IB OPCVL frameworks when analyzing different types of online sources, and what does this reveal about the flexibility and function of the OPCVL method?

## Participants and Recruitment

The participants were my Secondary 3 ( Grade 9 in North American contexts other than Quebec) history students at a private school in Montreal, Quebec ( $n=10$ ). This grade works well as there are no ministry exam pressures, and students have more flexibility in what they learn this year. This is also the age where many students are online consistently and would have been exposed to fake news (McGrew & Byrne, 2020). Moreover, it is during adolescence that students develop a greater capacity for critical thinking that is needed to discern fake from factual information (Ellerton, 2020).

The students are primarily from affluent parts of Montreal and attend a high-income private school with high tuition costs.

Prior to data collection, the research project was approved by the university's research ethics committee. To ensure ethical standards around data collection because the participants were my own students, all students and their parents were asked to sign an assent/consent form that was collected by a third party (a research assistant) who is not connected to my own research. Therefore, while teaching, I did not know who did and did not choose to participate. I thus taught and assessed all the students as I normally would throughout the intervention. Once the intervention was complete and I was no longer teaching these students (and had moved to another province to teach), I eliminated all the data of the students who chose not to consent. Thus, the research-participant relation did not have any influence on the results as the participants were made aware of the fact at the beginning of the intervention that I did not know who chose not to participate and this would not have any influence on their academic standing.

## Data Sources

### Strand 1: Pretest and Post-test Data

The study followed a one-group pretest-posttest design, with quantitative data collected from my students' pre-test and post-test scores (Price et al, 2017). Both tests are the same in format and follow a similar topic in health sciences. Test A is focused on whether red meat was part of a healthy diet, while Test B is focused on artificial sweeteners. Two sets of quantitative data were analyzed for

each pretest and posttest. This firstly includes the students source analysis from the pre and post-test which was graded according to Table 2. The evaluate section has further details as provided in appendix H. In task 1, students read three different sources and then give them an overall score of reliability between 0-100. Students were given a score of one if they picked the correct source for the least credible and zero if they did not identify this. Out of the sources in Test A it was determined by experts that source three, written by the Beef Cattle Research Council was the least credible source. In Test B, source two written by Health Consumers Product on behalf of Splenda was the least credible.

**Table 2**

*Pre-Test and Post-Test Scoring Breakdown by Task*

<b>SECTION 1: Evaluate</b>	
<b>Use the slider to choose a numerical value from 0 (not trustworthy) to 100 (very trustworthy)</b>	Record the ranking that students gave to the websites:  E.g., Website 1: 2 Website 2: 3 Website 3: 1  We will compare these rankings to expert rankings. This task was scored as 1 if the student correctly identified the least credible source.
<b>To what extent is resource 1/2/3 trustworthy?</b>  <b>First, click on the following link:</b> <a href="https://abbylangernutrition.com/is-meat-healthy-what-those-controversial-meat-studies-really-found">https://abbylangernutrition.com/is-meat-healthy-what-those-controversial-meat-studies-really-found</a>  <b>In point form (list form), explain why you chose this rating.</b>	For a list of acceptable responses, see table 5 below.  Two or more indicators, with at least one specific idea = 3 One indicator, with at least one specific idea = 2 points One indicator, with no specificity = 1 point (usually lack of specificity)

	<p>--OR--</p> <p>Specific evidence, with no indicator = 1 point (e.g., Dieticians of Canada)</p> <p>No / unclear indicator = 0 points</p> <p><b><u>No limit to score. Give points based on use of indicators and statement as above. For example, if 2 specific ideas with two or more indicators, a student can receive a 6.</u></b></p>
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In task 2, students were asked to justify their reasoning for their previous scoring of the source.

Students were graded on their ability to use context, source, and content in their analysis of the given online sources. There is no specific limit to the score and students were given points based on when they mention an indicator and how they are able to use it to justify their choice of trustworthiness as seen in table 3.

**Table 3**

*Scoring Criteria for justifications*

Scoring Criteria	Score	Example	Explanation
No/unclear indicator and/or evidence	0 points	“I don’t know” (Student 506)	Provides neither an indicator of credibility nor any evidence
One indicator, with no specific evidence	1 point	“Because it’s made by scientific experts” (Student 438)	Provides an indicator of credibility (that the authors cited in the paper are scientific experts), but does not provide proof of this—i.e., how do you know that the cited authors are scientific experts? What makes them experts (e.g., their education)?

Specific evidence, with no indicator	1 point	“Not a lot of contrast in sources” (Student 543)	The student correctly provides evidence that the sources cited on the webpage are one-sided, but does not indicate what this means in terms of the source’s credibility—does this make the source more or less credible? Why?
One indicator, with at least one specific piece of supporting evidence	2 points	“Bias source. Splenda is a company that’s sells artificial sweeteners, so I don’t trust as much of their opinion.” (Student 458)	Student correctly indicates that the source is biased and provides evidence of this (i.e., that Splenda, in providing information about the safety of artificial sweeteners, is acting in a conflict of interest)
Each additional indicator / piece of evidence	1-2 points (no ceiling)	Based on above point giving.	

In task three, students were instructed to write an email where they had to share an argument and synthesize the online sources to justify their reasoning. The email was scored based on a student’s ability to make a claim, use evidence and synthesize this evidence. This was scored in a rubric according to table 4. Students were given up to three points for claim, evidence and synthesis for a total of nine points. This means the students were evaluated on stating whether they recommend the product in the school, what evidence they bring in from the source analysis section and how the use the different types of evidence to defend their claim.

**Table 4***Pre-Test and Post-Test Email Rubric*

CLAIM	3 points	2 points	1 point	0 points
(Topic + Position; e.g., The cafeteria should keep red meat on the menu; or, The cafeteria should stop serving red meat; or, The cafeteria should serve red meat, but in moderation)	<p>There is a clearly stated claim (with topic [dealing with a.s./r.m.] + position) AND <b>it explicitly answers the prompt.</b></p> <p>Ex. Regarding the information I have learned on red meat I believe that Lauren hill shouldn't ban red meat but instead reduce the quantity of red meat meals being prepared and sold.</p>	<p>There is a <b>clearly</b> stated claim implicitly answers prompt</p> <p>Ex. Having red meat in small proportions is healthy</p>	<p>There is a claim, although it is only <b>somewhat clear.</b></p> <p>implicit claim</p> <p>Ex. Don't put them in.</p>	<p>The claim is <b>absent or unclear.</b></p>
EVIDENCE	3 points	2 points	1 point	0 points
<b>Examples:</b> reason; expert opinions; facts; statistics; paraphrasing; direct quotes	<p><b>Must Haves:</b></p> <p>The evidence is correct according to the experts (information from sources, prior knowledge or lateral reading)</p> <p><b>PLUS, one of the following is also present:</b></p> <ul style="list-style-type: none"> <li>• Attribution is given</li> <li>• There are 2 or more pieces of evidence</li> <li>• Answers the question</li> </ul>	<p><b>Must Haves:</b></p> <p>The information is correct according to the experts (information from sources, prior knowledge or lateral reading)</p>	<p>Must Haves:</p> <p>The evidence used is non-specific, weak, flawed or unclear</p> <p><b>AND</b></p>	<p>No evidence is used</p>

	‘why?’			
<b>SYNTHESIS</b>	<b>3 points</b>	<b>2 points</b>	<b>1 point</b>	<b>0 points</b>
	<p>2 of the following are present:</p> <ul style="list-style-type: none"> <li>● Information is combined to draw a *correct conclusion</li> <li>● A comparison or contrast is made</li> <li>● New insight is achieved</li> </ul> <p>*Correct according to the expert evaluation of the websites</p>	<p>1 of the following is present:</p> <ul style="list-style-type: none"> <li>● Information is combined to draw a *correct conclusion</li> <li>● Comparison or contrast is made</li> <li>● New insight is achieved</li> </ul> <p>*Correct according to the expert evaluation of the websites</p>	The conclusion or insight may be unclear or inaccurate	No conclusions or insight present

### Apparatus and Instruments

A pre-test and post-test was designed using articles based upon health sciences as seen in Appendix A. This test evaluates a student's ability to identify the credibility and reliability of various online sources. They also have used some of these sources when writing a draft email on a given scenario. The pre-test comprises three articles focused on the consumption of red meat. Each article has varying degrees of credibility, and students must rate each article and explain why they chose to rate it as reliable. Finally, they had to write a short email explaining if red meat should be consumed in their cafeteria by using their knowledge and the articles to support their thinking through synthesis.

The post-test follows the same format, but the articles are focused on artificial sweeteners. The tests are created in a way that allows students to assess the relevancy and credibility of an online source while also synthesizing the information they must create an argument. These have all been recognized as necessary to evaluate the credibility of online information resources (Forzani 2019; McGrew 2021; McGrew and Byrne 2020; Pehlivanoglu et al 2021). A rubric developed by Corrigan (2022) has been created to assess the students' responses based upon the 3-tiered approach. This rubric is on a scale of 0-3 and assesses the claim of the student (topic + position), the evidence they use, and how well they synthesize the information. The rating scales are shown in table 2.

Instructional material was also created for the digital literacy program. This material includes the following:

- Google Slides with all instructional notes for educators to use.
- Videos and Audio clips for some lessons.

Each section of the workbook and lesson has been further divided into the essential skills needed to help students use a 3-tiered approach (Forzani 2019) when evaluating and synthesizing sources online. These sections are divided into the following:

1.1 Introduction

1.2 Overview

2.0 Identifying the Problem

3.0 Locating Information

4.1 Evaluating Context

4.2 Evaluating Source

### 4.3 Evaluating Content

### 5.0 Synthesizing Information

### 6.0 Communicating Findings

## Analysis

Once all the data was collected and graded according to the rubrics, the total scores of the justifications, plus the correct identification of the sources were summed. Scores from the pre-test and post-test were compared using a paired samples t-test.

Student's justifications were also coded using the Forzani (2019) framework. The justifications were then identified as content, source and context. These justifications were then further divided into a "detailed" and "superficial" use of the Forzani framework. These codes were then enumerated to understand how often students referred to the Forzani framework in the pre-test and post-test and then compared on average to how students referred to the use of content, source and context. The first step was to identify which claims deserved low to high scores. I divided these further for my analyses into "superficial" that being 0-1 points, and "detailed" that being 2-3 points. Table 5 below gives some examples of student responses and where they would have scored with that claim in their justification.

**Table 5**

*Examples of Superficial and Detailed Responses According to Indicators*

	Superficial Response (0-1 points)	Detailed Response (2-3 points)
Context	<b>Setting</b> "recently updated(2019)" "The article is really up to date it was last updated on January 17, 2022"	<b>Setting</b> - "Another point is that this wasn't posted that long ago, as it was posted in October of 2019,"

		<p>meaning that the research that is compiled on the blog post must be fairly recent.”</p> <p>“The source is also relevant because it was released in January of 2022. This means that the source is using recent research to prove their research.”</p>
	<p><b>Resource Genre</b></p> <p>“- it appears to be a self made blog”</p> <p>“- It is from a trusted new publisher”</p>	<p><b>Resource Genre</b></p> <p>“This blog is opinionated which isn't always reliable as it is what someone thinks, but she does link studies and research to back her point as well as her own experience as a dietitian”</p> <p>“The website is from CTV news which is a trusted news network that many people know about. We know this because CTV is part of the Trust Project which makes sure websites are transparent, reliable, factual and accurate”</p>
	<p><b>Third Party Endorsements</b></p> <p>“A lot of adds,. Maybe they just made the website for money.”</p>	<p><b>Third Party Endorsements</b></p> <p>“splenda is a company that sells artificial sweeteners and so they are trying to mitigate the risks and are trying to both persuade, convince and sell me that i want this.”</p>
	<p><b>Rhetorical Techniques</b></p> <p>“- untrustworthy language”</p> <p>“Looks nice and trusty”</p>	<p><b>Rhetorical Techniques</b></p> <p>“I believe that there is a lot of information of the topic and it sources all of the sources however, in this case splenda is trying to sell a product so it gives no opposing view and only their view in attempt to sell their product.”</p>
Source Expertise (education, professional experience) Purpose	<p><b>Expertise</b></p> <p>“provides info about the author that tells us she's thoroughly studied this topic.”</p>	<p><b>Expertise</b></p> <p>“I chose a higher rating because I skimmed over the background of Abby Langer and I saw that she has been a nutritionist since 1999. I believe that this makes her source</p>

		far more credible not only because she is a specialist in the study of nutrition, but she also has been doing it for a while so I would assume that she knows what she's talking about.”
	<p><b>Purpose</b></p> <p>“This blog is opinionated which isn't always reliable as it is what someone thinks, but she does link studies and research to back her point as well as her own experience as a dietitian chose this rating because I know that CTV is a well known news reporting agency, though they are media, so they aren't completely trustworthy, because their intentions are to attract attention.”</p>	<p><b>Purpose</b></p> <p>“It's Health Consumer Products. Because Health Consumer Products has a lot of artificial sweeteners and sugar substitutes for sale and the information is provided by the manufacturer for Splenda, a very popular sugar substitute, they present the idea of the safety of using artificial sugar substitutes. This shows that they are automatically biased because they are trying to sell a product tied to the topic and therefore they are presenting their information in a way that may entice the audience to buy their products rather than presenting unbiased information.”</p>
Content  Argumentation (Author's knowledge claims, evidence, reasoning)	<p><b>Argumentation</b></p> <p>“-contains research and then the author's opinion on topic”</p> <p>“-lots of factual information and citing sources”</p>	<p><b>Argumentation</b></p> <p>“Another issue is the fact that the article mentions no sources not even throughout the entire article. I don't consider sources completely necessary if they're getting their own information from their own research (seeing as UnlockFood is a website brought to us by dietitians, this might be the case.), but the information would appear more factual if you have multiple sources to back it up to show that others share the same opinion as you or received the same results as you.”</p>
	<b>Knowledge Fit</b>	<b>Knowledge fit</b>

	N/A (Was not mentioned by students superficially)	“- I already don't know much and have never heard of UnlockFood and the website provides little to no real details or information about where they get their information or about who specifically writes their articles.”
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Once all students were coded and divided between a superficial and detailed use of the Forzani framework, the average use of each code of content, source and context and whether it was detailed or superficial was further compared from the pre-test to the post test per student. The goal was to identify which aspect of the Forzani framework seemed to demonstrate the greatest improvement and which aspect may have shown the least gain from the intervention. Codifying and enumeration has been used as it is an excellent approach to acquiring a contextual understanding of the intervention and any patterns that may arise in the student's ability to analyze after the use of intervention (Braun and Clarke, 2006).

For the Task 3 the rubric scores of the emails from the pre and post-test were compared as well. These rubrics assessed a student's ability to use the skills taught in the intervention for their claim, use of evidence, and overall synthesis of the evidence. Firstly, I analyzed this data holistically by adding up the total scores of the rubrics from the pre-and post-tests for each student. I also compared the scores between pretest and posttest for each sub-scale of content, source, and context to do each section of the rubric individually for each student. The data was analyzed using a paired samples t-test to check for any significant differences between the means of the students (Field, 2013). A summary of strand 1 procedure is in table 6 below.

**Table 6***Strand 1: Summary of Procedures*

Step	Description
1 Pre-Test Administration	<ul style="list-style-type: none"> <li>• Given to students before the CORE framework intervention.</li> <li>• Assessed students' ability to evaluate online sources (<i>content, source, context</i>).</li> <li>• Responses collected and coded using the Forzani framework.</li> </ul>
2 Intervention (CORE Framework Lessons)	<ul style="list-style-type: none"> <li>• Students participated in eight lessons focusing on evaluating digital sources.</li> <li>• Lessons incorporated lateral reading, source verification, and credibility assessment.</li> <li>• Activities included exit tickets, teacher-led discussions, and hands-on source analysis exercises.</li> </ul>
3 Post-Test Administration	<ul style="list-style-type: none"> <li>• Administered after students completed the CORE framework intervention.</li> <li>• Used the same structure as the pre-test but with different sources.</li> <li>• Designed to measure improvement in source evaluation, depth of justification, and synthesis.</li> </ul>
4 Data Analysis	<ul style="list-style-type: none"> <li>• Student justifications were categorized into superficial (0-1 points) vs. detailed (2-3 points).</li> <li>• Coding framework based on Forzani's model (analyzing content, source, and context indicators).</li> <li>• Paired samples t-tests conducted to compare pre-test and post-test performance.</li> <li>• Trends identified in how students improved in evaluating digital sources.</li> </ul>

## Strand 2: Culminating Activity

The culminating activity was a source analysis activity. Within this activity students had to research a topic of their choice and find a minimum of four sources to present their material. They then went into using the CORE analysis and the IB OPCVL analysis, each for two sources respectively. Primarily qualitative data was collected here and overall comparisons were made between the two analytical methods between the students. This was analyzed using a similar comparison instrument from Strand 1 where justifications were deemed superficial or detailed, and the referencing to context, content and source were noted on how often it was brought into the justification.

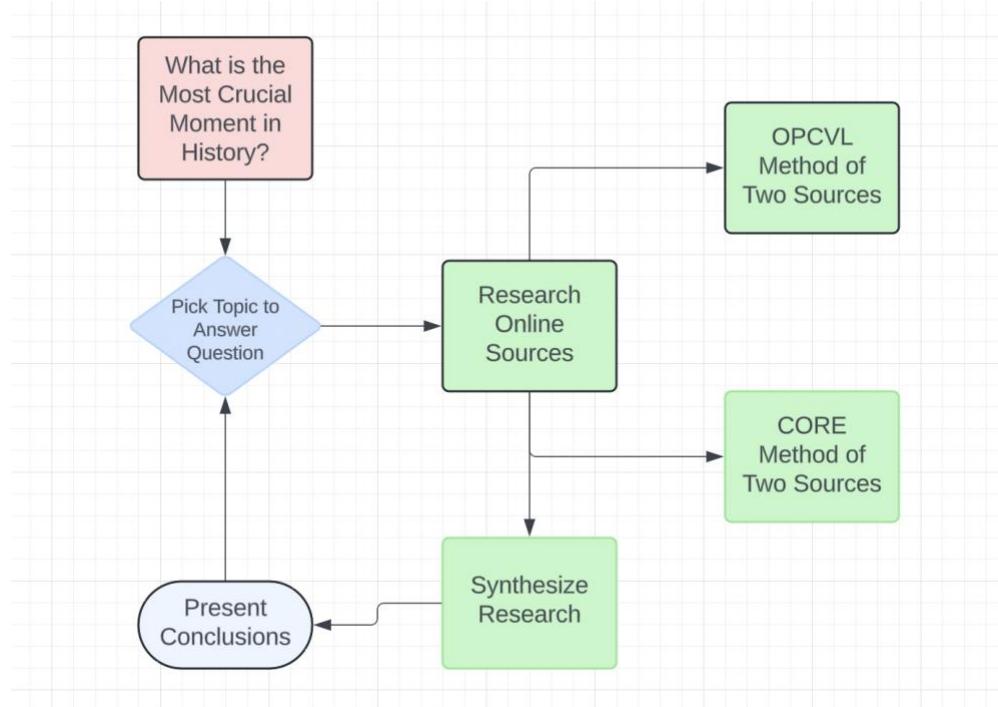
### Apparatus and Instruments

For Strand 2 data was collected through a major history research project entitled "Ten Days that Shook the World." Students completed this project in any way they chose, but they must complete a source analysis using both the IB method, entitled OPCVL (Origin, Purpose, Content, Value, Limitations), and the CORE digital literacy program method. The skills taught throughout the program and their own IB course was applied to this project. The project entailed students picking a specific date or event they believe is the most important in history. They must find at least six sources and apply two source analyses using the CORE method and two source analyses using the IB OPVL method. They then took the information they have found online and completed a written or oral presentation explaining why they chose the date they chose by synthesizing the information they found online to prove their thinking. Ultimately for this study, student's justifications were analyzed using a similar codification process as the pre-test and post-test by dividing up responses into content,

source, and context and then further divided into superficial and detailed responses. Qualitative comparisons were made between the analyses of the students for their project. The organization of the assignment can be seen in Figure 5, the focus of this study will be the green section of the research aspect of the assignment.

**Figure 5**

*Organizational Breakdown of Culminating Task “Ten Days that Shook the World”*



## Analysis of Strand 2

Qualitative data was collected from the culminating project and the pre-test/post-test. Codes and themes were created according to the Forzani framework using the terms content, source and

context. A thematic analysis was also applied to the student's final assignment, comparing their use of IB OPCVL analysis and the CORE Framework to see if there are differences or similarities between the two analytical approaches for the students in relation to content, source, and context. Firstly the total use of each indicator was identified and divided into superficial and detailed. Their responses in the culminating task were compared between the CORE and the OPCVL frameworks and identified as either superficial or detailed used of content, source and context. Once all responses were compared, it was determined whether the OPCVL or the CORE method were effective techniques for students when researching online sources for their culminating task, and if OPCVL can be used as a tool for lateral reading when looking at online sources. Furthermore, a comparative content analysis was done to look and the function and flexibility of these lateral reading strategies when applied to online research and whether OPCVL can also be used as an effective tool for these types of sources. The goal in this analysis was to demonstrate how these different pedagogical techniques apply in students analyzing online sources, as the majority of the participants' sources were basic historical or news websites and similar in nature.

Qualitative data was collected from the culminating project and the pre-test/post-test. Codes and themes were created according to the Forzani framework, categorizing student justifications into content, source, and context for the CORE method and origin, purpose, content, values, and limitations for the OPCVL method.

A thematic analysis was applied to students' final assignments annotated bibliography comparing how they used each framework when evaluating sources and the total use of each indicator between the OPCVL and CORE Method. Given that most students selected modern digital sources

(e.g., news articles, government reports, and other online materials) rather than historical documents,

the analysis also examined how OPCVL functioned as a tool for online source evaluation.

In addition to comparing detailed vs. superficial justifications, this analysis explored the flexibility and adaptability of each framework:

1. How did students attempt to apply OPCVL to non-historical sources, and where did challenges arise?
2. Did OPCVL's categories (such as origin and purpose) still prove useful in evaluating digital information, or did students struggle to make them fit?
3. What patterns emerged in students' use of each framework across different source types (e.g., news articles vs. government reports)?

Once all responses were analyzed, a comparative discussion was made to determine not only how students used each framework but also which elements of OPCVL could still be valuable for digital source evaluation and where its limitations were most apparent in an online research context.

Finally a justification would be made as to whether the CORE method is a preferred method for students in the IB programme in using online research or if OPCVL is potentially a satisfactory method as well. A summary of the full procedure for strand 2 is in the table below.

**Table 7**

*Strand 2: Summary of Procedures*

Step	Description
1 Student Selection of Sources	<ul style="list-style-type: none"> <li>• Students selected four sources related to a historical event.</li> <li>• Two sources were analyzed using the CORE framework (modern digital</li> </ul>

	<p>sources: news articles, government reports, etc.).</p> <ul style="list-style-type: none"> <li>Two sources were analyzed using the OPCVL method (historical sources: speeches, primary documents, etc.).</li> </ul>
2 Source Analysis Process	<ul style="list-style-type: none"> <li>Students evaluated their sources by answering structured guiding questions under each framework.</li> <li>CORE evaluation focused on: Content, Source, and Context.</li> <li>OPCVL evaluation focused on: Origin, Purpose, Content, Values, and Limitations.</li> </ul>
3 Written Justification Assignment	<ul style="list-style-type: none"> <li>Students wrote justifications explaining their evaluations.</li> <li>Justifications were assessed based on depth of analysis and use of framework indicators.</li> </ul>
4 Data Analysis	<ul style="list-style-type: none"> <li>Responses were coded into <i>superficial (0-1 points)</i> vs. <i>detailed (2-3 points)</i>.</li> <li>Comparisons were made between CORE and OPCVL justifications to assess how students adapted each framework.</li> <li>Thematic analysis was conducted to examine patterns in student difficulties, framework flexibility, and source application.</li> </ul>

### Strand 3: Action Research Journalling

The action research journal as a reflective practice was created with a pre-set of questions that I would answer during and/or after the lesson (Yu et al., 2015). The goal of this journal was to reflect on the processes that seemed to work the best within the lesson and that generated engagement from the students. Student engagement was noted when students would be asking questions during the lesson

and how well they were working with each other during the activities and not distracted by other websites on their laptop. This data was primarily used in keeping track of student engagement throughout the lessons and to keep track of any potential limitations this study may have faced due to repeat absences by any of the participants which may influence the overall results of the post-test.

#### Apparatus and Instruments

During and after each lesson, I noted observations of the lessons and how students have responded to the different lessons used throughout the intervention. Action research journaling is a tool for recording your learnings and reflections (Johnsen & Christensen, 2014). The journal was used in two ways. One through observations and interpretations of my own fieldnotes (when students used the 3-tier framework language), and the other was through reflective journaling on how I believed the lesson went and its overall impact on the students.

The goal of the journal was to identify, qualitatively, how often the students were integrating the skills learned, lesson by lesson, in their reasoning when having open dialogue on the sources they were working with. I also took note of overall class size and if there were any students missing that day due to other school responsibilities which may have an impact on the reliability of my study.

#### Analysis

The action research journal was primarily used to demonstrate if there were any significant pedagogical techniques from the interventions that were used that generated strong engagement through the students question and their answers in using the 3-tiered framework during our discussions. This was completed through observations of this engagement and this language, and

reflective journaling of were students actively participating and engaged with the lesson that day.

These were noted throughout the journal and used further to corroborate any findings that were noticed in the pre-test post-test data or the culminating project source analysis. A summary of the procedure for strand 3 is below in Table 8.

**Table 8**

*Strand 3: Summary of Procedures*

Step	Description
1 Daily Teacher Reflections	<ul style="list-style-type: none"> <li>Maintained an Action Research Journal throughout the study.</li> <li>Documented student engagement, challenges, and instructional effectiveness during lessons.</li> <li>Reflected on student struggles and successes in applying CORE and OPCVL.</li> </ul>
2 Recording Observations on Student Learning	<ul style="list-style-type: none"> <li>Noted how students interacted with the source evaluation frameworks in class discussions and assignments.</li> <li>Tracked patterns in student misconceptions, preferred strategies, and difficulties in synthesis.</li> </ul>
3 Identifying Pedagogical Effectiveness	<ul style="list-style-type: none"> <li>Reflected on which teaching strategies helped or hindered student learning.</li> <li>Assessed whether instructional scaffolding was sufficient for students to apply CORE and OPCVL effectively.</li> </ul>
4 Data Analysis	<ul style="list-style-type: none"> <li>Conducted a thematic analysis of journal entries to identify trends.</li> <li>Key themes included: engagement levels, student struggles with lateral reading, and difficulties applying OPCVL to modern sources.</li> <li>Cross-referenced journal observations with student assessment data (Strand 1 &amp; 2) to reinforce findings.</li> </ul>

## Ethical Considerations

There are many ethical considerations to consider with my study as it involves minors, and the intervention includes subject material that has become more controversial, such as vaccine mandates and spread of misinformation as a topic. Due to the involvement of minors and the inclusion of my classroom students, the following ethical considerations were followed:

- All participants had the choice to consent to the study, and consent must be obtained from both the parent and the student. Another member of the research team collected consent forms. I told the participants this so they do not feel pressured into participating by me as the teacher. Participants were also informed that they can remove their data from the research at any point during the intervention and the analysis of the data. Therefore, this study used a process of continuous and informed consent.
- The consent forms notified all participants of the directives and purpose of the intervention. All participants' names are anonymous in the study's publication. Students' names were replaced with pseudonyms for publication purposes. The research team only accessed all personal information shared through the demographic questionnaire.
- The intervention contained no language that would be unacceptable for high school students. Plain language was used to ensure greater accessibility for study participants.
- The intervention content does deal with the debate surrounding vaccines, the COVID-19 pandemic, and school closures. Opinions on these topics have become increasingly polarized. If students find these topics to be hard to discuss, they were notified that they do not have to continue to participate.

- I examined my subjectivity during and following the intervention. As it is my own class, I obviously was biased towards the intervention being successful. I was aware of this researcher bias (reference) when analyzing all data. This may also happen during my classroom observations and intervention reflections after completing the lesson.
- The most important ethical consideration was to ensure that no harm came to any of the participants throughout the intervention and the research publication. This includes sharing opinions, ensuring that no participants are to put each other down for the answers to the questions, and ensuring that all participants felt supported throughout the lessons. Therefore, students felt supported to participate in an inclusive and safe manner.

## Chapter 5: Results

### Introduction

Regarding research question one, this study found that the use of the CORE intervention did have a significant effect on improving students' abilities evaluating online sources using the three-tiered method. Students had a large improvement in identifying and using "source" as a tool to evaluate the sources in the pre-test and post-test. However, for the email task that required students to write an email synthesizing online sources of information from three websites, the results were not significant. Therefore, this showed that although the intervention was useful in building a student's ability to evaluate an online source, when it came to synthesizing these sources to support an argument, there were little to no improvements made. This could be due to the fact that only one detailed lesson was taught regarding developing synthesis skills. This lesson focused on the different between a summary and synthesis with some examples how synthesis is different and involved students completing a concept map activity by choosing sources to defend a position of whether or not a school should close during COVID. This activity had very little time for feedback as students were then moved onto working on their summative project.

In terms of research question two, the comparisons of student responses for the CORE method and the IB OPCVL method demonstrated that both methods led to relatively the same outcome with regards to their detailed uses of reference source, content and context. There were slightly better responses using the CORE method as students would often refer to source in more analysis and detail than the OPCVL method; this could be because the OPCVL method is strictly used

by history teachers and taught to students in a history class when analyzing historical sources, whereas the CORE method is much more tailored to the use of online sources.

## RQ 1: Effectiveness of CORE Intervention

Research question one asked how and to what extent did the CORE intervention improve the student's ability in critical online research? Specifically, it also asked how did the quality of students' written justifications change from pretest to posttest?

### Strand 1: Pre-Test Post Test

The results of the analysis demonstrated that although the participants had an understanding of the what made a source credible, they managed to show improvement in their ability to explain how and why a source may be credible or not. There was an overall improvement in their justifications of why a source may be reliable and credible by using the language taught to them.

### Score analysis with table breakdown

In Tables 9 and 10, all scores can be seen from the students results on their pre-test and post-test in regard to their ability to picking the correct source for the least credible and their justification scores in using the proper indicators. In the pre-test, many of my students struggled with identifying which source was the least credible. Many of their justifications were rather simple. Often at least one indicator was mentioned; however, it was done in a superficial manner without explaining how it really connected to the reliability and credibility of the source.

Meanwhile in the post-test, the correct credible source identification was 5 out of 10 students, up from just 1 of 10 students from the pre-test. The justification scores were also much more developed and convincing when referring to content, source and context. These connections between one of these indicators and why they chose their score was better synthesized. For example, Deborah (a pseudonym) identified

“It's Health Consumer Products. Because Health Consumer Products has a lot of artificial sweeteners and sugar substitutes for sale and the information is provided by the manufacturer for Splenda, a very popular sugar substitute, they present the idea of the safety of using artificial sugar substitutes. This shows that they are automatically biased because they are trying to sell a product tied to the topic and therefore they are presenting their information in a way that may entice the audience to buy their products rather than presenting unbiased information.”

Within this statement Deborah identifies that although Health Consumer Products may be a potentially good source, the fact that the information is funded by Splenda, an artificial sweetener producer, then the content of the article would be biased as they are trying to sell their product. This was a much better improvement than the pre-test as many students did not identify the potential bias approach of the beef lobby group in their article.

**Table 9**

*Pre-Test Scores by Student per Section (all names are pseudonyms)*

Name	Correct Source for Least Credible Score	Trustworthiness Justification score	Total
Florence	0	5	5
Andrew	0	5	5
Jill	0	8	8
Deborah	1	15	16
Anna	0	5	5
Vince	0	4	4
Anthony	0	5	5
Adam	0	6	6
Phil	0	9	9
Brit	0	8	8
Totals	1	70	71

**Table 10**

*Post-Test Scores by Student per Section*

Name	Correct Source for Least Credible Score	Trustworthiness Justification score	Total
Florence	0	16	16
Andrew	0	11	11
Jill	0	11	11
Deborah	1	15	16
Anna	1	8	9
Vince	0	3	3
Anthony	1	8	9
Adam	1	5	6
Phil	1	13	14
Brit	0	7	7
Totals	5	97	102

**Table 11***Score Totals by Section*

	Correct Source Chosen for Least Credible	Justification Scores	Totals
Pre-Test		1	70
Post-Test		5	102

Descriptive Statistics Statement

Table 12 shows the descriptive statistics for the total scores of the pre-test and post-test after the intervention has taken place. Students had higher overall scores after the intervention ( $M = 10.2$ ,  $SD = 4.290$ ) as opposed to before the intervention ( $M = 7.2$ ,  $SD = 3.490$ ).

**Table 12***Descriptive Statistics Results of Pre-Test and Post-Test***Paired Samples Statistics**

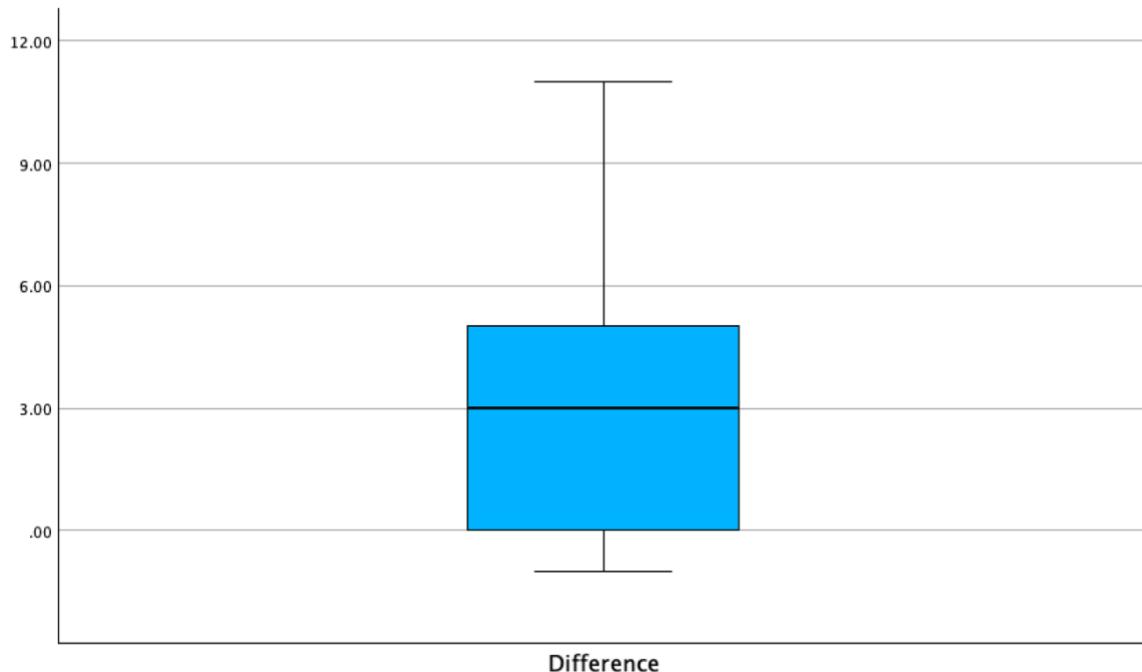
	Mean	N	Std. Deviation	Std. Error Mean
Pair 1	AfterTest	10.2000	10	4.28952
	BeforeTest	7.2000	10	3.48967

T-Test Statement

To test the significance if the intervention was successful in building students' abilities in identifying reliable and credible online sources, a paired samples t-test was conducted. Firstly, there were no outliers in the data, as assessed by inspection of a boxplot for values greater than 1.5 box-lengths from the edge of the box as can be seen in Figure 6. The difference scores for before the intervention and after the intervention were normally distributed, as assessed by a Shapiro-Wilk's test ( $p=.236$ ). Thus, a paired samples t-test could appropriately be used for this study.

Table 13 indicates that the intervention elicited a statistically significant increase in scores on the post-test compared to the pre-test results,  $M = 3.0$  ( $SE = 1.192$ ),  $t(9) = 2.5$ ,  $p < .05$ . This means that the CORE intervention did help with building the skills necessary in identifying reliable and credible online sources.

**Figure 6**  
*Box Plot Analysis of Potential Outliers*



**Table 13**  
*Paired Samples T-Test Results*

	Paired Samples Test								Significance			
	Paired Differences		Std. Error Mean	95% Confidence Interval of the Difference		t	df					
	Mean	Std. Deviation		Lower	Upper							
Pair 1 AfterTest - BeforeTest	3.00000	3.77124	1.19257	.30222	5.69778	2.516	9	.017	.033			

## Use of Indicator Analysis

To further understand the results of the t-test and what strategies by the students may have been influenced the most by the intervention, a cross-tabulation table was created to see the differences in pre-test and post-test responses when it comes to superficial uses of the indicators and detailed uses of the indicators in a qualitative comparison of the responses and codes identified as source, context and content. In the Post-test results there was a large increase in the identification of the indicators, whether superficial or detailed, from an average per student of 4.7 instances to 7.1 instances. We can see that when it comes to detailed responses, which is what a good evaluator would use, we see large increases in content and context from just an average of 0.6 per student in the pre-test for content to an average of 1.7 detailed uses in the post-test. Table 14 indicates the total amount of mentions/use of a detailed content analysis of all participants to justify their scores was originally only used once between all ten students, whereas the post-test there was ten total uses between the ten participants. Although detailed responses with the use of source also have increased, it is at a much smaller level which could be due to the fact my students have been taught to identify the origin of sources and their significance to the reliability of an online source through the IB program; which means many of the students have been exposed to this form of analysis before. Ultimately the average amount between all participants of detailed uses of the CORE method of source, content and context has increased from 1.3 mentions per student during the justifications for the pre-test to 4 mentions per student on the post-test. This is nearly a 207.7% increase on average in the use of the effective strategies in identifying the reliability and credibility of the source.

**Table 14***Cross-Tabulation of Use of Indicators Between Pre-Test and Post-Test*

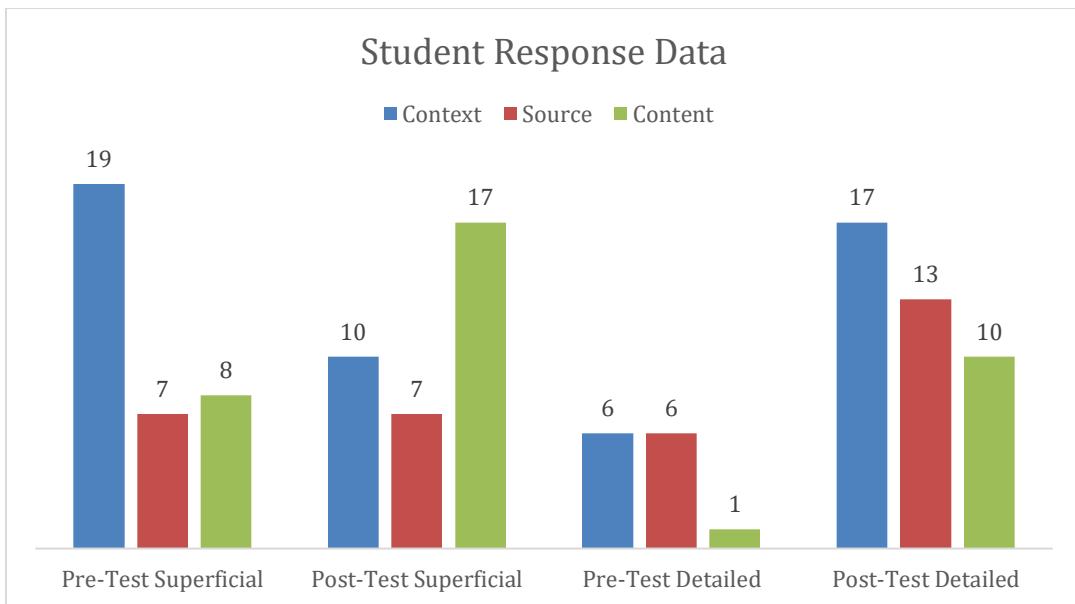
CORE Enumeration	Pre-Test		Post-Test Mentions	Row Totals
	Total	Mentions		
Content			25	
Superficial	8	17		
Row				
Percentage	32%	68%		
Source				
Superficial	7	7	14	
Row				
Percentage	50%	50%		
Context				
Superficial	19	10	29	
Row				
Percentage	66%	34%		
Context				
Detailed	6	17	23	
Row				
Percentage	26%	74%		
Source				
Detailed	6	13	19	
Row				
Percentage	32%	68%		
Content				
Detailed	1	10	11	
Row				
Percentage	9%	91%		
Column				
Totals	47	71	118	
Column				
Percentage	40%	60%	100%	

## Context

Figure 7 presents the visual comparisons of the data and uses of the indicators in the student's responses.

**Figure 7**

*Side-By-Side Bar Graph of Student Uses of Indicators*



It is clear that context as an indicator has had the greatest changes both superficially and detailed from pre-test to post-test use. This could be because students during the intervention learned to look more at the currency of the source, the genre and the endorsements on the website. Students were already inclined in looking at genre and what purpose this genre may have. For example, the genre of a political speech is usually used to persuade and so it may not be completely reliable as an academic source, but it is reliable in understanding the potential motive of the speaker; however, the use of currency as a form of reliability and looking at what potential endorsements are in the source are new

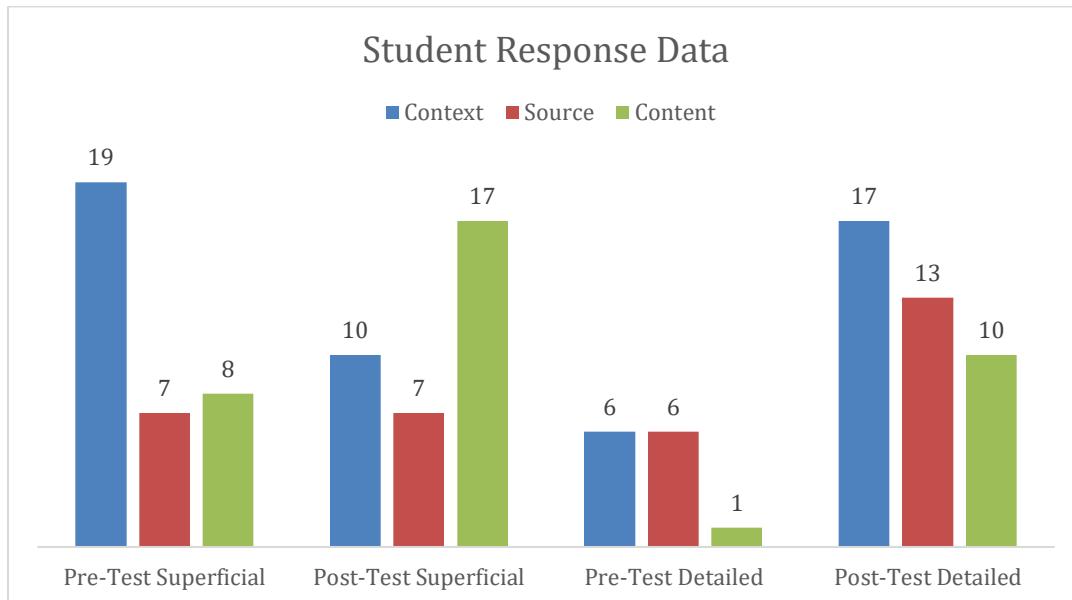
to the students but also a very straightforward skill for them to learn. The currency of the article is only mentioned a couple times in the pre-test by the students; however, it starts to become more used and connected to reliability by the students in the post-test. For example, Florence states “this source was posted in 2017, so much has changed from then until now in science therefore we cannot trust those sources Although the sources the author uses are good sources, they are not relevant to the time because the research was done from 1999 to 2012 which is not relevant to the time.” This student identifies the publishing date as being quite old if being used as a source in 2021/22. They also go even further by looking at the dates of the evidence that is used in the article as being also very old. A wonderful technique of looking at currency and explaining why it may be an unreliable source for the study of health.

Within context, there is also a substantial increase of looking at potential third-party endorsements as a way of justifying their rating from the pre-test to the post-test. For example, one student stated about the BCRC article, which was identified as the least reliable source, - “I've never heard of the BCRC as it is no very well known and therefore, may be unreliable and/or biased.” Another student stated “The sites main purpose is research of beef and cattle.” Clearly both students recognized the publisher and created the website but did not go into detail about the impact of this on the reliability of the source. By the post-test students began to be more critical of these third-party endorsements and advertisements on the website. For example, Florence stated “I believe that there is a lot of information of the topic and it sources all of the sources however, in this case Splenda is trying to sell a product so it gives no opposing view and only their view in attempt to sell their product.” They

recognized the endorsement of Splenda making this online source unreliable due to the motive behind the company. Deborah noted of another source in the post-test “As, this is run by Dietitians of Canada, their information and input is very relevant, as this is a discussion surrounding diet and we are in Canada.” Thus, she recognized that this online source was endorsed by a recognized organization that have many experts in the field of the nutrition of artificial sweeteners. The use of third-party endorsements and advertising on the website were indicators that increased greatly from the pre-test to the post-test.

**Figure 8**

*Side-By-Side Bar Graph of Student Uses of Indicators (repeated)*



## Content

It is also important to note in the data is that the weakest indicator for students was in identifying and using content as a way of understanding of credibility and reliability of a source. Referring to Figure 8, content is often referred to in a superficial way, even after the intervention. Students are briefly taught to examine what is being said in a document in the OPCVL method, but it is also a difficult method for them to then connect it to a source's reliability. Students are often able to state that the source lacks the use of corroboration or other sources to support the authors opinion, but they do not go further with this and explain the "why" this relates to it not being reliable or credible. For example, Andrew states "-this source summarizes information from other sources. -it shows who wrote the info from the other sources and includes a link." Clearly the student recognizes that there is some corroboration here, but they do not identify what the sources are, why they may be good and what this shares about the source's reliability. Another student Jill wrote, "There is no evidence to support the side effects of artificial sweetener being in these foods and consuming them." Once again, the student recognizes in this source that it lacks any corroboration, which is something very important to recognize, but they do not go far enough in explaining the "why" this makes a source unreliable or not credible.

The use of knowledge fit is also very new the students and very few of them used this justification in either the pre-test or post-test. One student shared "The topic was related to our topic but wasn't exactly ours." They recognize that what is in the article relates to the topic they are studying, but it is a superficial connection the content and does not go far enough explaining why this may be important.

## Source

The use of source did see some improvements in being used in greater detail from the pre-test to the post-test. This was evident in many of the students doing a more detailed search into the expertise of the author. For example, Jill in in the pre-test stated “This website is a blog that is written by a dietitian. Although she is registered it is only one person who is reviewing this article.” She notes that is a dietitian is the author and so has some credibility in the topic of red meat, but it is a rather superficial use of source. For the post-test she then states “The article was written and has been reviewed by dietitians from across Canada though it has not stated who they are. There is a possibility these dietitians can be biased on certain things. The article is from a trusted publisher such as the dietitians of Canada.” This explanation identifies the potential authors, but she recognizes that because they have not been named this means it may be less reliable of an article. She also questions that the purpose of the article may be skewed as the dietitians may have some bias on some topics. Although not all her reasoning may be 100% correct, she uses the source in a more detailed manner and questions the online source with much more scrutiny than her pre-test response. Similar instances were noted in other students’ responses where more scrutiny was of the source of the article was then questioned by my students, as seen in Appendix C. Overall there was an increase from just an average of 0.6 total detailed mentions of source between in the pre-test to 1.3 instances on average; doubling the average mentions.

### Task 3: Email Scores Analysis and Synthesis

In Task three of the pre-test and post-test, students were to write a short email using the sources they just read to help justify a claim about a topic: Firstly on the pretest, whether to have red meat in the school menu and secondly on the posttest whether to have artificial sweeteners in the school. Students were graded by the rubric in table two. The first thing to note is one student did the first email but not the post-test email and so their score was removed as to maintain consistency. The total scores are for each student are in Table 15.

#### Total Score Analysis

**Table 15**

*Email Scores by Student*

	Pre-Test	Post-Test
Florence	4	4
Andrew	4	3
Jill	4	8
Anna	4	5
Vince	3	4
Anthony	3	3
Adam	3	3
Phil	5	5
Brit	4	6

As seen in table 16, the intervention did not elicit a statistically significant increase in scores on the post-test compared to the pre-test results,  $M = 1$  ( $SD = 1.481$ ),  $t(8) = 1.575$ ,  $p = >.05$ . This means that we cannot conclude if the CORE intervention helped students in their ability to make a claim, use evidence and synthesize it into their work.

**Table 16***Paired Samples T-Test Results for Emails*

	Mean	SD	SD M	t	df	One-sided P	Two-Sided P
Intervention	.778	1.481	.494	1.575	8	.077	.154

This tells us that the intervention did improve a student's ability to evaluate an online source, but it did not have a significant effect in helping students synthesize that information into an argument.

#### Sectional Analysis

Seen in table 17 the students received the following scores for each part of the rubric.

**Table 17***Total Scores by Section of Rubric for Students*

Name	Email Rubric Survey 1 Scores			Total	Email Rubric Survey 2 Scores			Total
	Claim	Evidence	Synthesis		Claim	Evidence	Synthesis	
Florence	2	1	1	4	2	2	1	4
Andrew	2	1	1	4	2	2	1	3
Jill	2	1	1	4	3	3	2	8
Anna	2	1	1	4	3	2	2	5
Vince	1	1	1	3	2	2	1	4
Anthony	1	1	1	3	1	1	1	3
Adam	1	1	1	3	1	1	1	3
Phil	2	2	1	5	3	2	1	5
Brit	2	1	1	4	3	3	2	6

Looking at the scores themselves, there were some gains made on creating claims and picking the correct evidence in their emails; however, there was very little gains made on synthesizing that evidence effectively to support their claims. The students' responses can be seen in appendix D with their grades. An example of an improvement in evidence from the pre-test to post-test is Florence's response. Firstly, she states in the pre-test:

Dear school comitee,

I hope this email finds you well, on regards to if we should be able to serve read meat in school, I do not think that serving it would be a problem because there can be some nutritional benefits. However, I do believe that there needs to be balance in the diet which the school is giving to the students. Therefore, there should not be too much read meat being served. I think that serving read meat once a week is a good balance nutrition wise, because it does have lots of protein and lots of iron.

Sincerely,

There is clearly a claim here that is stated, but the use of evidence is unclear and it does not pull from the sources in an explicit manner. In her post-test she states:

Hello,

I hope this finds you all well, regarding the questions of if we should or should not have artificial sweeteners, I believe that we should not, because there are so many negatives about putting these unhealthy substances in our bodies. Although health canada says that artificial sweeteners are safe it is important to also understand that children should probably stay away from them, which is why I believe that it would not be the safest idea for there to be artificial sweeteners on the menu.

Sincerely,

Here a simple claim is made again, however she refers to a specific source here and synthesizes in a way that is rather simplistic. The important thing of note though is there is an explicit reference to one of the pieces of evidence by using Health Canada in their response.

This was a common theme from the pre-test to post-test. Students were still relatively strong in using their claims, but there was a much larger difference in their ability to pull in evidence from the articles they used. Synthesis remained weak, mainly from comparison and mentioning some form of new insight. When students did synthesize it was mainly to draw in a conclusion. For example, Anna stated “If you are to do research on why artificial sweeteners are bad it shows that they can lead to weight gain, brain tumors, bladder cancer, and many other health hazards. These reasons are why we should not add artificial sweeteners to the menu.” Here there is a reference to some of the research in a superficial way, but it is used to conclude that artificial sweeteners should not be added to the menu. Here the scores of their emails related to the overall quality of their ability to synthesize the articles they felt were reliable to use to support their ideas. Students often used the correct source material to support their reasoning why artificial sweeteners are bad; but they were unable to effectively synthesize it by being explicit with which source they were referring to.

Thus, the intervention did help students understand how to state a claim, something many of them were taught during essay writing lessons in different courses previously, and there were improvements in pulling evidence to support that claim, but the synthesis was still a weaker skill for many of the students. It was noted as well in the reflective journal that students were beginning to have fatigue with the intervention, and the lessons that focused on synthesis and claims were the final two

lessons and so students were already less engaged and participative. This could also have influenced their ability to do well on the emails as the participants were already asking if the intervention was almost done as they were hoping to start something new in the course.

## RQ 2: Pedagogical Techniques Analysis

Research question two asked what pedagogical approaches can be used to teach students critical online researching skills? It further asked how did students apply the CORE and IB OPCVL frameworks when analyzing different types of online sources, and what does this reveal about the flexibility and function of the OPCVL method?

### Strand 2: Ten Days That Shook The World Source Evaluation

To analyze the two different pedagogical techniques that my students have learned in evaluating sources, I simply applied the source analysis rubric used in the pre-test and post-test source evaluation to both the students OPCVL and CORE analyses. This allowed me to compare the scores between the students and see if there was any significant difference in the score and to maintain consistency with the pretest posttest grading. The scores for the students who managed to complete this part of the assignment,  $n=8$ , are in table 18. Ultimately, I observed only minor differences in the quality of the analyses between the two pedagogical techniques, with only one student, that being “Jill”, who had a significant increase in their analyses. Thus a statistical analysis I felt was unnecessary given the data clearly shows insignificant differences between the two.

**Table 18***Score of Indicators by Student for each pedagogical method*

	OPCVL	CORE
Phil	14	14
Brit	18	18
Adam	1	2
Florence	12	14
Vince	12	14
Deborah	22	20
Jill	16	22
Andrew	9	8
<b>Total</b>	<b>104</b>	<b>112</b>

The students' responses and how they were graded differently with examples are in Table 19.

Perhaps the biggest takeaway from the different methods is how the students organized their responses, and which indicators were of focus. As stated in the literature review, the OPCVL method, particularly the Origin section, has students really identify the who wrote it and when it was written. In majority of the participants responses, the currency and experitise of the source material was identified clearly. For example, Jill stated about her one source: "This source is a secondary source. It is an article written on an event, in this case the Treaty of Versailles. They include primary sources such as photos from the actual period. There is no clear author stated, so it is presumed to be written by the United States Holocaust Memorial Museum. It was published on the Holocaust encyclopedia but there is also no publish date stated."

Here we can see that she identifies what kind of source it is, and where it was published.

However, the analysis of whether the source is reliable is not touched upon in her values or limitations

section. For Jill's CORE analysis, she has a bit more detail when using the important indicators. For example:

**“Context”**

The text is about the effects of the Treaty of Versailles and how they led to World War I and other lasting problems. It is a well organized text. It includes links within the article and has different subtitles on what each paragraph is about. The URL also suggests that it is a secure website as it includes a lock showing a secure website. The website is History which is a trusted history website. It is very relevant to my research questions, as it specifically provides me with information on the effects of the topic.

**Source**

The author of the article is Sarah Pruitt and it was published on the website History. There is no point of view on the article or prominent bias in the article as it is just for informing people about the effects of the Treaty of Versailles.”

Within this analysis, she identifies the author explicitly, the URL, organization of the article and why it is relevant to her studies. This goes just a bit further than her previous analysis thus scoring slightly higher on the rubric. This helps answer our second part of research question two, in that OPCVL seems to be a more difficult framework to apply when using it for online sources, such as websites; whereas the CORE framework seems to be more nuanced and easier for students to apply detailed lateral reading strategies.

**Table 19**

*Breakdown of Student examples of Superficial and Detailed uses of Indicators by Pedagogical Method*

	Superficial-2-3 or more points	Detailed 0-1
<b>International Baccalaureate Method using OPCVL</b>		
Content (Argumentation, Knowledge Fit)	<p>The source gives information about when the bombs were created, and how they were created. In addition it gives the information to how it got to the point where the USA believed the bombing was crucial.</p> <p>The document talks about the political implications of the Chernobyl Disaster. The main idea of this source is that there are many consequences of the event, some environmental and health, and presents the political ones.</p>	<p>The article uses primary source images to convey the events that were occurring. An image of a couple talking to a family in an apartment building across the wall. Images from checkpoint charlie during the crossing and some others.</p>
Source (Expertise, Point of View, Purpose)	<p><i>"The Economy and the Internet: What Lies Ahead?" was written by Alice M. Rivlin and Robert E. Litan on December 1 in 2001, published by Brookings Author is mentioned but no deep analysis of who they are.</i></p> <p>Value: Although the author isn't given this source is still very credible as it comes from history.com which is an</p>	<p>This article was written by Abigail Lebovitz. They spent 4 years at Stanford University studying for a Bachelor in Arts, Human Biology and spent 10 months working as a Research Technician at Massachusetts General Hospital.</p> <p>The website doesn't have a specific author linked or credited to the page and this is because this page is a government page. We can see this because the URL ends with ".gc.ca" which is representative</p>

	<p>extremely well known source and it's known to be credible.</p>	<p>of the government of Canada. The government of Canada is the body responsible for the federal administration of Canada. Because of this, this source automatically ranks high on credibility. The article is posted under the name of the Canadian Nuclear Safety Commission. The Canadian Nuclear Safety Commission is the federal regulator of nuclear power and materials in Canada.</p> <p>The purpose of the article is to inform. It tells the story of how and why the wall was created and the series of events that lead up to the mass crossing at Checkpoint Charlie.</p>
Context (Setting, Genre, Third Party Endorsements)	<p>The origin of this document is History.com.</p> <p><i>Publisher is identified with little explanation of its impact.</i></p> <p>This text is meant to inform, as it tells us the details of their trip, and the impact and aftermath of the landing, and to persuade because it is trying to persuade us into understanding why this is an incredibly important moment of modern history.</p>	<p>We can tell that the author is using this document as a way to document and inform their audience about the political issues that were prompted by this disaster. The circumstances of the creation of this article was for coursework. We can see this reflected because of the text at the top of the page “Submitted as coursework for PH241, Stanford University, Winter 2016” alluding to the fact that this is coursework. The author presents an outsider point of view and doesn't seem to have connections or ties to the actual event in question. During the time that this article was published, it would have been</p>

		around the time of Chernobyl's 30th anniversary.
<b>CORE Method</b>		
Content (Argumentation, Knowledge Fit)	<p>This is a crash course video made by John Green. It uses a variety of images that are mostly primary sources. They contain images from press conferences and memorable events like the Berlin airlift and many others.</p> <p>In the article it specifically talks about the Fourteen Points, the Paris Peace Conference, the terms of the Treaty of Versailles, and criticism of the treaty and other relevant information.</p>	<p>The video has many primary sources varying from quotes to images as well as secondary sources from scholars explaining different events and strategies that occurred during the cold war.</p> <p>This article, written on a public article posting website, was published on the 30th of June, in 2021 by a PhD professor of Geoscience. It is published 52 years after the landing itself. So its perspective on the subject, being the international impact of the Apollo 11 landing, takes into account all of the aftermath impact years later,</p>
Source (Expertise, Point of View, Purpose)	<p>This article is extremely relevant because it explains the direct impact of technology, but is slightly credible. This blog is written by parents who write blogs, who have an unknown level of expertise and aren't necessarily qualified to write the blog.</p> <p>The author of the article is Sarah Pruitt and it was published on the website History.</p> <p>The context of this source is that it comes from a very reliable source as the person who wrote it is someone who has studied this topic, meaning he's looked</p>	<p>The author is highly qualified and is an expert in this field. Castells is a professor of Communication Technology and Society at the University of Southern California,</p> <p>This article, written on a public article posting website, was published on the 30th of June, in 2021 by a PhD professor of Geoscience. It is published 52 years after the landing itself. So its perspective on the subject, being the international impact of the Apollo 11 landing, takes into account all of the aftermath impact years later,</p>

	at all the different perspective in order to give out this information.	
Context (Setting, Genre, Third Party Endorsements)	<p>The information on the website is very error free and also very organized, there are different sections of the article that are divided which makes it look very put together and professional looking.</p> <p>the context of this source is that it comes from a very reliable source as the person who wrote it is someone who has studied this topic, meaning he's looked at all the different perspective in order to give out this information.</p>	<p>He has no need to push or sell due to the fact that his paid partnerships have nothing to do with his content and are purely based on infomercials placed at the beginning or end of his videos.</p> <p>This article from Colombia.edu, was published on the 17th of July in 2019, and written by Nicole Deroberts. This source was published exactly 50 years after the actual landing, which meant the moon landing was a while ago and had been thoroughly analyzed by the time it had been published.</p>

### Stylistic Evaluation of Source Differences

The stylistic differences are also interesting to note between the students and how they approach each method. Most students when applying the OPCVL method created subtitles for each section of the method and wrote a short paragraph for the section. They would divide up their response by Origin, Purpose, Content, Values and Limitations. Meanwhile some students within the CORE analysis would write it as one full paragraph; while some divided it up similar to the OPCVL method and divided it into small paragraphs by Content, Source, and Context. The students who did divide up their work into smaller sections had, in most cases, clearer connections to the indicators.

What was most noted was a student's ability in identifying why the source they chose for their project may be reliable or unreliable. Within the OPCVL method this should be stated in the Values and Limitations section, where students identify what may be valuable about their source studying their topic and what could be the limitations of this source. For example, one student stated:

**Value**

The article is written from the Holocaust encyclopedia. This means that they are writing this from the perspective of what the Treaty of Versailles led to in World War II.

**Limitation**

Since it is a secondary source, it does not include a direct perspective from what people thought during that time period. The article can be biased about the reasons that World War II started such as the Treaty. It does leave out other reasons that Nazism and the second world war was influenced.

The analyses here refers to some of the origin, purpose and some of the content, but it was rather weak in the reliability analysis. The student referencing how it does not include "direct perspectives" from the people is something that is taught to them when doing limitations of secondary sources for studying history specifically. OPCVL thus struggles with this important aspect of lateral reading when researching with online sources; whereas CORE does not.

This is the same student's CORE analysis:

**Con[t]ext**

This text is about the treaty of versailles. It is well structured and organized with general information surrounding the topic. It includes links within the article and other related articles below. It is a secure website and article as shown by the lock in the URL. The website is History which is a trusted history website. It is very relevant to my research question as it provides me with lots of information on my topic.

**Source**

The publisher is the website History.com and is written by the editors of the website. There is no biased point of view of the article as it is just for research about the treaty. It is meant to inform the readers on general information and facts on the topic.

## Content

In the article it specifically talks about the Fourteen Points, the Paris Peace Conference, the terms of the Treaty of Versailles, and criticism of the treaty and other relevant information.

The context and source sections are much more detailed in talking about the reliability of the source, as she refers to it being a secure website, from a trusted history website and the point of view is unbiased. The content, once again a weakness for many students, identifies what is in the text but does not really connect it to reliability and leaves out evidence of corroboration. Both scores were relatively the same for the student, the OPCVL method receiving an 8 due to less indicators being spoken about, while this one receiving a ten due to the more detailed connections to reliability.

The differences between these two methods of analysis can be influenced by the project that the students were working towards and so this could be due to the very little disparity between the overall scores of the students. The OPCVL method is primarily used by students in the history programs of the IB and so it is well suited for this type of project. The method is meant to have students focus in and take the perspective of a historian studying the topic they chose, and so when doing the analysis that is the focus of their values and limitations. They must ask themselves what valuables and limitations about this source for a historian are trying to learn about their topic. Whereas the CORE method is much more tailored to analyzing the reliability and credibility of, specifically, online sources. This could be used in most classes and is a skill that is more applicable to day-to-day life in its approach.

## OPCVL in the Digital Context

Perhaps the most important thing to note about the different pedagogical techniques and their use in online digital source evaluation is the potential limitations of the OPCVL framework. The use of origin and purpose for digital sources were of difficulty for the students as it was often done in a superficial manner. This could be due to the fact that news sources and government sites do not have a clear single author or historical context. This prompted students to give broad assumptions of the origin and purpose of these websites rather than jumping into potential funding biases or editorial stance. For example from one student

This article was written by the editors of Encyclopedia Britannica and was published by Britannica on their website. It was last updated on August 19, 2022. It is a secondary source that analyzes the Treaty of Versailles (1912). Britannica is a highly reliable and trusted source meaning that we know that the information being published is accurate.

This is a clear identification of origin; however, it is a relatively simplistic way of saying it is reliable just because it must be as it is Britannica.

Students also struggled with identifying the values and limitations of a digital source. Students found it much easier, when they used a historical source, to identify its potential biases but struggled to articulate the limitations of digital sources, other than the fact it is a secondary source and may not be accurate to what people believed during the time period they are studying.

Perhaps the biggest limitation that was noted by the OPCVL framework and students using it for online digital sources is that it lacks flexibility for real-time source verification. Unlike the CORE which explicitly encourages lateral reading, OPCVL has always been taught for a history course and so

is focused on internal source analysis rather than external verification. Many of the students did not look for additional sources to confirm claims when completing their OPCVL. Students were not encouraged to fact check some of the sources they researched as OPCVL does not explicitly tell them to look for corroboration like CORE. For example, one of the stronger OPCVL analyses is below:

**Origin**

This article was written by Abigail Lebovitz. They spent 4 years at Stanford University studying for a Bachelor in Arts, Human Biology and spent 10 months working as a Research Technician at Massachusetts General Hospital. During the winter of 2016, Lebovitz was present for the Stanford course “Introduction to Nuclear Energy” and submitted a report entitled, “Chernobyl and its Political Implications” on February 18, 2016. This was for this course. This is considered a secondary source because within the article Lebovitz filters through information to present and evaluate the political implications of the Chernobyl Disaster.

**Purpose**

Because this was turned in for a course, the intended audience was probably the course teacher and/or their other classmates. However, because this was published publicly, the audience could also be anyone who is looking for information on the subject. This document exists as submitted coursework for the Stanford University course “Introduction to Nuclear Energy”. The intent of the document is to present the information of the political consequences of Chernobyl.

**Content**

The document talks about the political implications of the Chernobyl Disaster. The main idea of this source is that there are many consequences of the event, some environmental and health, and presents the political ones.

**Value**

We can tell that the author is using this document as a way to document and inform their audience about the political issues that were prompted by this disaster. The circumstances of the creation of this article was for coursework. We can see this reflected because of the text at the top of the page “Submitted as coursework for PH241, Stanford University, Winter 2016” alluding to the fact that this is coursework. The author presents an outsider point of view and doesn’t seem to have connections or ties to the actual event in question. During the time that this article was published, it would have been around the time of Chernobyl’s 30th anniversary.

**Limitations**

From this source, we can not tell the point of view from, say for example, someone who was and may still be affected by the event. If so, we may be able to pick up information about the generational consequences of the event or some of the more directly affected people. Also, because this is a secondary source and it was turned in as coursework, the author wasn’t present for the actual event and therefore can’t tell us what the actual event was like for those who went through it. However, the author doesn’t present any sort of side for the argument and so I can concur that the evidence

that they are presenting isn't skewed or biased. What is purposely being left out is the environmental and health effects of the disaster but this was a decision made to keep the main focus of the document on the political effects.

When going through this OPCVL analysis of their chosen source, they are very detailed in looking at the source and potential context of the source. The currency is mentioned, the publisher and the author are also well researched. When addressing the content however, whether directly in the students content section or their values and limitations, the use of corroboration is not mentioned and is much more focused inward on the content of the source they are studying rather than using the lateral teaching strategies that the CORE method uses. However, even when using the CORE method students still struggled with this skill but were usually more active in questioning the evidence the author uses in the text. As an example, one of the students' CORE analysis states for their Khan Academy source:

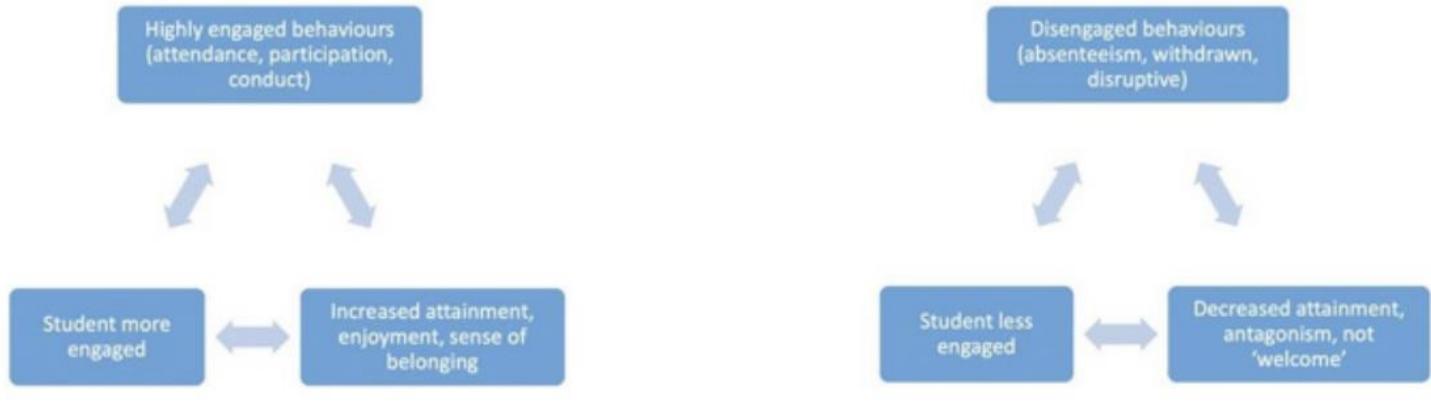
The context of this source is that it is credible to the genre of my project because it is discussing the bombing of hiroshima, and why it is so important to history. The information on the website is very error free and also very organized, there are different sections of the article that are divided which makes it look very put together and professional looking. The source is credible because the article is written by a professor in history which proves that he did his research well and he is a professional in his field. In addition, the author of the article sources all of the information in correct formatting, in addition the links he used were also written by credible sources. The content of this source allows me to answer my research question because it discusses why hiroshima is so important to history which is what I am looking for in my project.

Here it is clear, although rather superficially, the student makes more active engagement with the content of the source and looking at potential corroboration the author is using to describe the event they are researching. It is clear here that the use of the CORE method is much better suited for

students as a lateral reading strategy when completing online research as it explicitly asks students to look at things like corroboration and use of outside sources for the author's written work; whereas, the OPCVL method is not as explicit in asking students to do this and so it makes it less flexible for students when completing research.

### Strand 3: Action Research Teacher Journal with Field Notes

While pre/post-test results demonstrated increased use of source evaluation indicators, observations from the Action Research Journal provided deeper insights into how students engaged with the CORE framework in practice. The action research journal and field notes was focused on finding which lessons demonstrated the most engagement. Engagement could be measured through if the students were actively using the terminology from the CORE framework throughout the lessons; and if they were able to apply this on an assessment effectively. The first being noted in the journal and the latter the results on the post-test. It was also used to help corroborate potential findings in Strands 1 and 2 as students who used the CORE terminology more often would theoretically be more likely to perform better on the post-test. The goal was to see which lesson styles seemed to drive the most engagement which was noted in the journal based on student involvement in discussions and when pacing around the room how many students were on task for different activities. Student participation and use of taught language can be seen as a form of engagement. Once the lesson was complete, I also completed some reflection questions for myself on how I believe the lesson went by reflecting on the level of engagement and excitement in the class.

**Figure 8***Manjor Nair Engagement Flow Chart*

*Manjor Nair\*. Measuring Student Engagement In A High School Context. Sch J Psychol & Behav Sci. 6(1)-2021.*

*SJPBS MS.ID.000229. DOI: 10.32474/SJPBS.2021.06.000229*

As seen in figure 8. High engaged behaviours can be seen through participation and increased attainment of material.

Throughout the intervention, it was noted that there was differing levels of use of the CORE language. Within the lesson focused on evaluating source I noticed a distinct shift when looking at source. The beginning of the lesson students would often look at the date but then this started a shift. As noted in the journal “I noticed more students using phrases like ‘this author has expertise because...’ or ‘I need to check who funds this website.’ By the end of the lesson, several students were cross-referencing sources and making stronger claims about credibility.” It is clear that they were engaged with this material as they were pulling in a lot of the lesson material and applying it to the activity.

The locating information lesson was also one that was noted of being highly engaging with students. A socratic based lesson that involved questions and answering about fake news. This discussion was noted to have many students asking questions and sharing their responses. The students were also wanting to learn how to use the fact checking sites that were presented in the lesson. Finally what was noticed to have the most engagement was the more student-centered lesson of having students roleplay a townhall meeting that took the course of two lessons. Within the journal I noted “There was very little time for students to get off topic and the lesson ran quite smoothly. The class was quiet and focused throughout. As I was walking around the room during town hall prep, most students were actively researching material.”

I also noted “During town hall, the overall arguments were presented with specific evidence from the articles they found the day before. They referenced the author/site that they found the information.” Here my observational data indicated that the students were on-task researching and excited to prepare for the townhall, and then during their debate used some of the CORE analysis, in particular the use of source, to support their arguments.

The lessons that employed a more student-centered focus with them working groups seemed to generate the most discussion. This was noticeable in the mind-map activity and the townhall. The socractic lessons also brought some engagement, but often relied on the same students to respond to the questions.

By the end of the intervention many students were asking about when it would be over as fatigue started to set in as noted in the journal; however, there was some observation of engagement with the intervention itself as students by the end of it began to use the language more often taught to

them. Students began to naturally default to the CORE language and found it easier in some aspects when doing their research for the culminating activity.

## Chapter 6: Discussion

### The CORE Intervention

The intervention which follows the theoretical framework of analyzing credibility and reliability of online information through content, source and context (Forzani, 2019) was used to create the CORE intervention (Corrigan, 2021). It involved 9 lessons over the period of 3 weeks with 10 students. This intervention was mainly used to teach students to read laterally by looking into the how the three indicators named earlier can help determine whether a source is credible and reliable for my students' research.

The results demonstrated that this intervention was successful in helping students develop their understanding of what makes a source reliable and credible. It had a significant effect on students' evaluation scores. This was certainly evident in their justification scores where not only did their scores increase, but the number of times they referred to an indicator also increased. The students were also keener in using a detailed connection to the indicators rather than a superficial one. For example, many students began to look at the authors expertise in greater detail and explaining why this may influence the article's credibility; whereas before the intervention students were able to identify the author but did not make a clear connection to the author's expertise and why it may be a credible or not credible source. This intervention's goals were to build students' metacognitive processes by becoming more critical readers by helping them think flexible and using lateral reading strategies through triangulation and the 3-tiered approach as developed by Forzani (2019). Thus, not only did

the students' ability in identifying sources that were unreliable improve, but so did their ability to use triangulation by looking at and referring to content, source and context to prove their justification for choosing the reliability of each of the sources in the post-test.

This shows that a lengthy intervention can have a significant impact on students' abilities to analyze sources in a critical way by questioning them in detail to help identify whether they are reliable and credible to use in their research. This study corroborates studies done by McGrew (2020) and Kohnen et al. (2020) that also showed the effectiveness of interventions in educational environment. The main difference is they used shorter interventions that helped develop some lateral reading strategies of the students, whereas this intervention, although much longer, helped build students become greater experts on the internet by diving deeper and understanding URLs, looking for potential third-party endorsements and looking for corroboration of evidence in the online sources. It was also noted in the journal that students began to naturally default to the CORE language when looking at the sources and began to question their research more often by reading laterally and looking at things like the URL, the potential ads or funding a source may receive and what kind of evidence is used in the source.

The intervention was also successful as many of its lessons had a student-centered learning approach which seemed to draw in more engagement with the students by getting them to think critically about the example sources that were being taught to them and work in small groups to question the topics that were being taught to them. As noted in the journal, students were particularly engaged in the lessons that allowed them to work with one another to critically analyze sources or find evidence to help defend their arguments, like in the townhall lesson.

## Claim, Evidence, Synthesis.

Although the intervention was successful in building the necessary skills for students to read an online source laterally and identify its credibility and reliability, the intervention was unsuccessful in helping students use evidence and synthesize this evidence to support a claim. Before the intervention, many students were quite well versed in creating a claim as they have been taught essay writing since Grade 7 and have learned how to develop a thesis statement. A skill that was certainly lacking was using the sources and then connecting this evidence to their claim. Even after the intervention, student still scored low in their ability to use explicit reference to evidence and connect this to their claim in an obvious manner. In some cases, evidence was mentioned; however, it was not stated where this evidence came from and if it was simply the student's own opinion or not. For example, Anna stated "In my recent observations and research I have been able to come up with the idea that having beverages and meals with artificial sweeteners on the menu not to be in the best intention of the students. Although it is proven to be safe for all ages of children, we mainly as the school as you know have been trying to incorporate more of a balanced and nutritious meal plan for the students throughout their days learning." Here the student states from their research, but without mentioning a specific source this becomes a weak statement as where the research comes from is really the important part of this statement that must be included for the student to be convincing in their statement.

It is possible this was still a weak point for students after the intervention could be due to a few reasons. The first one could be as the intervention was completed over nine lessons; this may have led to fatigue of the intervention as noted in action research journal. Many students by the end of the

intervention began to lose focus. Some students even noted during the lesson and would ask when the intervention was to be finished demonstrating clear fatigue with the process. It is possible the email task itself could have influenced their results.

The students are quite well versed in essay writing and can demonstrate adequate ability in defending a thesis statement. Since this was an email, the students may have not made the connection that the claim made in the email was essential a thesis statement that needed evidence to support it. Perhaps it was the task itself that may have created a mental block.

Another reason is the intervention itself focused two lessons on this skill, whereas the rest of the intervention was more focused on connecting the 3-tiered framework to evaluate online sources. Synthesizing the evidence to support a claim has always been a difficult skill for many students to learn throughout my career, especially at a younger grade in Grade 9. Students have always been able to identify potential information to support them, but being able to turn that information into evidence by connecting it to their thesis or claim is something that is often a missing component in their answers or essay writing. Thus, the skill of synthesis is something that needs a lot of practice through a student's high school journey.

The final reason that potentially the synthesis and evidence section may have not improved in a significant way is due to the post-test not being graded. Students in many cases are motivated by grades, which is especially relevant in my school's culture. Many students at this school are expected to go to post-secondary institutions of high reputation and so their efforts are often put towards things that will award them grades in the end. As this post-test was not graded, some students may have rushed to complete it and so did not put their full effort in writing a well detailed email and use the

appropriate evidence to support their claims. It was noted in my journal that some students throughout the intervention asked if things were graded, and if the pre-test and post-test would be graded. Since the only thing being graded was the final culminating assignment, more effort was put towards this than the intervention tasks.

There are ample recommendations that can be added here. It would be well worth it to have a separate intervention that can be used across different grades that focus in one how to use the evidence students have found and synthesize it to support their claims. This intervention could then be tested to see how much it has improved a student's understanding of what synthesis is.

## Pedagogical Methods in Teaching Source Analysis

Within my findings, it was shown that both the CORE and the OPCVL pedagogical methods are sound methods in teaching source evaluation; however, I believe this does depend on what the research is being used for. The IB is a well-respected curriculum that is known for building critical thinkers and implementing metacognitive practices in the teaching. This is especially seen within their diploma program and the theory of knowledge curriculum where students are taught to ask questions about what they are learning and how they know things to be true across subject areas. The OPCVL method is focused in the history classes for diploma program and individuals and societies curriculum for middle years program. My students in this course are automatically enrolled in the middle years program at my school and so have been exposed to this method since Grade 7. By grade 9 the students have become well versed in identifying the origin, purpose and the content of a document and why it may be valuable or not to what they are studying. Within their final source analyses for their project,

many students were well adept at talking about the currency of the source, who the author was, the overall context of where the source came from and what was written in that may help them in their research. Ultimately determining what the values and limitations were of the source was still quite simplistic in their approach and is a skill they are continuing to develop. While completing the analyses for the OPCVL method was that the students really focused in on how a historian would view the document they were analyzing rather than a more holistic approach of looking at it as reliable or credible online source. This was a clear difference between OPCVL and the CORE method. As this method is only used in a history setting, the students struggle with taking a more holistic approach and apply it in a general sense. This means they are too focused on the historian's perspective, and they are not looking at it from a general research perspective when analyzing its limitations and values. This is a clear weakness of it as a tool for evaluating online research.

The CORE method, using the 3-tiered framework developed by Forzani (2019), is a new method for the students. Throughout the responses of the students, it was noted the greater detail that was put into analyzing the website, the potential third party endorsements and the detailed expertise of the authors or publishers in the topic they were looking at. Students also better incorporated and connected these indicators to analyzing the credibility and reliability of this sources than the OPCVL method. For example, below Deborah used source to almost an expert level when analyzing her source.

"The Interpreter is a website made by the Lowy Institute that is an international website that offers commentary and analysis on international issues. John Carlson is the author of this specific article. Carlson was a member of the Advisory Board of the International Commission on Nuclear Non-Proliferation and Disarmament and is currently a counselor for the NTI (the Nuclear Threat Initiative, Washington) on nuclear non-proliferation, disarmament and verification issues. He is also a member of the Asia Pacific Leadership Network for Nuclear

Non-Proliferation and Disarmament, Nuclear Fuel Cycle Royal Commission, South Australia and a Fellow of the Institute of Nuclear Materials Management. Because of all the above mentioned, I fully heartedly believe that John Carlson is fully certified and qualified to speak and inform on the issue of the nuclear Chernobyl disaster”

This analysis went much deeper than her Origin section of her OPCVL analysis but was also done in a more general researcher analysis and not just focused on a historian’s perspective. Thus, the CORE method has shown as a much better tool to build students’ general ability in research, reading laterally and analyzing sources in a more critical way. OPCVL has a clear drawback in being able to be used as a framework for students when doing online research as it is much more internal source driven rather than lateral reading.

The CORE method is also a great tool in developing some of the students’ OPCVL skills as there is some overlap in how the sources are analyzed. The source indicator can help students build upon their origin sections of the OPCVL method in greater detail and still be used from a historian’s perspective by diving deeper into the source’s origins and expertise of the publisher or author of the document or text they are reading.

Further research could be done in understanding the overall difference between students who are IB history students and have been exposed to the OPCVL method for many years and regular students in the Canada context when evaluating online sources. This research would give a better idea whether having the background in IB plays a role in a student’s ability to research and think critically about the credibility of online sources they are researching. This would also help determine if the previous experience to OPCVL method had any influence on my students’ results with the CORE method.

## Chapter 7: Conclusion

The CORE method is certainly a feasible intervention for many grade levels and schools across the curriculum. It would be recommended though to develop an intervention that could either seamlessly fit into a school's timeframe easier and/or be shorter but manage to fit the necessary 3-tiered framework ideas. The intervention itself was successful in building my students as critical thinkers when looking at online sources; but could only fit into my classroom schedule by implementing a project that was history related in the end to cover the necessary curricula for the government. This would especially be straining for any grades that may have external exams to complete, and so the time allotted for the intervention would not fit into the schedule of the teacher and students to be prepared for said external exam. However, if this intervention could be adapted to fit within a curriculum more explicitly than it could be successful in helping students tackling the misinformation that is ever present on social media and the internet. I would also recommend having this intervention continue to be applied in a cross-curricular format to give students more choice in how they are using it and what topics they wish to explore with this framework.

Even after the intervention, my students still struggled with synthesizing the evidence that was given to them. This leaves room for future intervention development that is better suited and focused on this skill to help students with building this necessary skill. Being able to use evidence and connect it to an argument is an everyday skill that is needed in academics and day-to-day life. Having the

CORE intervention be focused on just source evaluation would help shorten it, potentially making it more effective and less likely to have student fatigue.

Finally, both pedagogical techniques explored in this study were effective at building students' critical thinking when doing research and looking at sources. As this study focused on a history assignment when using both techniques, it is recommended to try these pedagogical techniques in other subjects or cross curricular to have a better understanding of the effectiveness of them. As stated earlier, it would also be interesting to do further research with IB students and compare their abilities to non-IB students in critically analyzing online sources without an intervention. This could give insight to the potential strengths of the IB OPCVL method of source analyses.

In conclusion, this CORE intervention did demonstrate the importance of having information literacy classes for high school students. In this era of post-truth and ease of access to many different types of information online through the internet, it is of the utmost importance to have some form of information literacy lessons or courses to help students be able to identify and critically analyze the online material that they are observing everyday through their devices so as not to be fooled by misinformation or false facts.

## Limitations

There are some limitations to this study that can influence the results or overall generalizability of the study. Firstly, this is a relatively small sample size ( $N=10$ ) as it is only my class that this study focused on, and not all students had parental consent, as well as, in this school class sizes are very small due to the high tuition fees and the promise of the school of capping class sizes to less than 20 students per teacher. This would make this school unique from other Quebec classroom contexts where it is not uncommon to have greater than 30 students in a classroom. Another significant limitation of the study is that the intervention itself took over nine lessons during a period (April and May) where students were missing 1 or 2 lessons due to outside responsibilities such as sports or school trips. This may also influence some of the results. The IB curriculum approach to source analysis may also influence the results due to similar skills and approaches. This extraneous variable was studied using a source analysis assignment to compare the IB approach to the CORE approach and account for any overlaps of theoretical approaches. A one-group pre-test post-test design also has its limitations. As the intervention was in an uncontrolled classroom setting using quasi-experimental approach, there were many factors that could have influenced the result of the post-tests, such as maturation due to the length of the intervention. It is possible that my students may have seen things outside of class throughout the intervention that are in relation to the spread of misinformation as it was a popular topic in the media during this time which could influence the results of the post-test (Price et al, 2017). Another limitation could be the journal observations itself. As it was done by the researcher for their own class, bias in observation could have occurred as well as some reflections were done after the

lesson had been complete due to time constraints during the lesson. This could have influenced some of the reflections as well.

Some other limitations to this study is that my students were already well versed in the OPCVL method and had already been taught this method for 2 years.

By using the CORE rubric as well to grade the OPCVL method, this may influence some of the scoring as the CORE rubric itself may be slightly slanted to score the CORE method higher than the OPCVL method.

## CORE Intervention Conclusions

The Critical Reading Online Evaluation intervention improved the participants' ability to identify credible online sources. It developed their reasoning for justifying why a source is credible by referring to its context, content, and source material. The participants now had the language necessary to help them develop a much more detailed justification when analyzing the credibility and reliability of online sources. This was evident in the use of detailed justifications and use of examples in defending their justifications increasing by a significant degree from pre-test to post-test. Participants improved greatly upon referring to the source and context of sources when justifying their reasoning for whether a source is credible. The improvement in context is notable as this was a new skill for many of the participants, as many of the participants have never thought to look deeply into the URL and the potential sponsorships of a website or study before. Very few participants look at these in the pre-test, whether in a superficial or detailed way. During the post-test, more participants used this as a way of justifying their choices for the rating of different sources. Overall, this intervention was successful in building the necessary skills and the language to help the participants in this study be able to analyze online sources in a critical way using metacognition, student-centered lessons, and Socratic discussions.

Although the intervention was useful in building the skills of analyzing online sources, it did not necessarily improve the participant's ability to synthesize these sources in defending a claim. The participants were already familiar, in some respects, with making a claim or thesis statement due to previous experiences. However, the synthesis of sources to defend that claim was still quite a new skill for many of them, and the intervention itself dedicated only 2 lessons to this skill. The lessons

themselves were more traditional and instructor-based with some student practice. It was also near the end of the intervention so fatigue may have played a role in the participants' engagement and ability to focus. This time of year as well was also a busy time of year for sports and other events in the school which saw quite a few participants miss these lessons which may have influenced the overall results. Ultimately the intervention did not have any conclusive results whether it improved a student's ability in synthesizing the online information they research into evidence to support a claim.

### Origin, Purpose, Content, Values, Limitations (OPCVL) in comparison with CORE conclusions

Both analytical techniques from the OPCVL to the CORE method had relatively similar ability in helping the participants justify the credibility of an online source they researched. When analyzing the participants' responses, the total use of the indicators was noted and there were scores attached that did not show a significant difference between each analytical method. The main difference that was noticed between the two methods is how the students approached them differently stylistically. The OPCVL method was more split up with subheadings (origin, purpose, content) whereas the CORE method was written as a complete paragraph in most cases. This could be because the OPCVL method was originally taught like a formula for students to fill out, and they have not been taught the way to incorporate it into a fully flushed-out paragraph response. Overall, the OPCVL method was a useful tool in helping students identify credibility; however, the CORE method did a better job of making students look into the actual website and publisher of the online sources as it forces students to think about who the publisher is, the ads that are on the website if there is a sponsor

and the URL. It was also much better at forcing students to read laterally and bring in corroboration.

The OPCVL method does not do this as it is primarily a method for the IB history course and so its focus is on historical documents and internal source analysis. There are similar skills between each method which could be why there was not a significant difference in the total indicators used and the overall quality of the analysis in the annotated bibliography.

## Relevance and Significance of the Work

Since the beginning of this paper, it seems there continues to be a need in the population to be able to critically evaluate the information they are receiving online. Just recently Meta has decided to remove fact-checkers from their apps (Booth, 2025) which has made this study even more important in understanding the best pedagogical methods in building the necessary skills for students today to best learn how to critically evaluate online sources and to be able to identify misinformation when they see it. One recent New York Times article interviewed students and teachers and found that the majority of teenagers use social media applications for the majority of their news intake, although some recognized this was a bad habit it has not stopped them. These apps include things like Instagram (controlled by Meta) and TikTok (The Learning Network, 2024). This is especially alarming as the study mentioned in the literature review by the Stanford History Education Group demonstrated that many teenagers when absorbing the news and information online do not always think critically about what they are reading and may take what they see as fact (Wineburg et al. 2016).

One of the first recommendations made by that study for educators is to help students build the necessary skills for reading laterally so they can approach these sources more critically and avoid any

confirmation bias or misinformation they may be exposed to. Thus, this study was one way of demonstrating what lateral teaching methods were effective in helping students build this aforementioned skill and what teaching methods throughout the intervention seemed to help students understand this method better. The CORE intervention and the use of the 3-tiered method of lateral reading demonstrated that it was a significant contributor to helping students build the necessary skills to read laterally and think critically about the information they are reading. They showed a significant improvement in being able to justify concerning source, content, and context on why a source they are reading may be credible and a reliable piece of information.

The goal of this study was to, hopefully, demonstrate one potential solution that educators can use to help their students be more critical of the information they read online and eventually this should help the potential spread of misinformation on social media and other websites. This study is not without its limitations, especially due to its size. Therefore, I recommend that this intervention be further developed with educators in Quebec and the government so that it can become developed into the curriculum that can be used in social science and English classrooms. Currently, it is simply a recommendation, but it should become a mandatory part within the curriculum of Quebec, and in Canada. The skills taught in this intervention are paramount to building civically responsible citizens and preventing further bipartisan political beliefs in our society. It would also be important to test this intervention on a much larger scale and within schools that may not have access to the same technology as the participants had in this study; as access to technology may also play an important role in building these necessary skills. In conclusion, this study demonstrates that the pedagogical

methods and student-centered approaches used in the intervention helped build the necessary lateral reading skills, using the 3-tiered approach, to better justify whether a source is online or credible.

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## Appendix A: Article Selection for Core Analysis

Characteristics of the Online Resources on the CORE Evaluation

CORE Evaluation Version A: Red Meat				
Title	Author and/or Publisher and Year	Genre	Primary Rhetorical Purpose of the Resource	Secondary Rhetorical Purpose (if present)
<a href="#"><u>What those controversial meat studies really found: Is red and processed meat healthy?</u></a>	Abby Langer (2019), Registered Dietician and media consultant	Professional Blog	To inform	To sell (her services as a dietitian, guest speaker)
<a href="#"><u>Red and processed meat linked to heart disease, mega-study says</u></a>	Sandee LaMotte (2021), CNN journalist, on behalf of CTV News	News	To inform	N/A
<a href="#"><u>Nutritional qualities of beef*</u></a>	Beef Cattle Research Council (2022) lobby group	Lobby group website	To persuade	To inform
CORE Evaluation Version B: Artificial Sweeteners				
<a href="#"><u>What are the different types of sweeteners? Are they safe?</u></a>	Dieticians of Canada (2022)	Website for a professional organization	To inform	

<a href="#"><u>Six foods you'd never guess contain artificial sweeteners</u></a>	Jill Waldbieser (2017), journalist, on behalf of <i>Women's Health Magazine</i>	Magazine article	To inform	
<a href="#"><u>Scientific Summary*</u></a>	Heartland Consumer Products (2019), on behalf of Splenda®	"Scientific" Summary	To persuade	To sell (more Splenda)

## Appendix B: CORE Scoring Criteria for Task 2: Evaluation Justification

<b>Scoring Criteria</b>	<b>Score</b>	<b>Example</b>	<b>Explanation</b>
No/unclear indicator and/or evidence	0 points	“I don’t know” (Student 506)	Provides neither an indicator of credibility nor any evidence
One indicator, with no specific evidence	1 point	“Because it’s made by scientific experts” (Student 438)	Provides an indicator of credibility (that the authors cited in the paper are scientific experts), but does not provide proof of this—i.e., how do you know that the cited authors are scientific experts? What makes them experts (e.g., their education)?
Specific evidence, with no indicator	1 point	“Not a lot of contrast in sources” (Student 543)	The student correctly provides evidence that the sources cited on the webpage are one-sided, but does not indicate what this means in terms of the source’s credibility—does this make the source more or less credible? Why?
One indicator, with at least one specific piece of supporting evidence	2 points	“Bias source. Splenda is a company that’s sells artificial sweeteners, so I don’t trust as much of their opinion.” (Student 458)	Student correctly indicates that the source is biased and provides evidence of this (i.e., that Splenda, in providing information about the safety of artificial sweeteners, is acting in a conflict of interest)
Each additional indicator / piece of evidence	1 point (no ceiling)		

## Appendix C Pre-Test and Post-Test Responses

### Pre-Test Source 1

Jaya Del Greco (Jill)	<ul style="list-style-type: none"> <li>- This website is a blog that is written by a dietitian. Although she is registered it is only one person who is reviewing this article</li> <li>- This blog is opinionated which isn't always reliable as it is what someone thinks, but she does link studies and research to back her point as well as her own experience as a dietitian</li> <li>- Overall the article is quite biased and she doesn't expand a lot on her research</li> </ul>
Alexandro Assaf (Andrew)	<ul style="list-style-type: none"> <li>-not many ads</li> <li>-contains research and then the author's opinion on topic</li> <li>-gives solution</li> <li>-provides info about the author that tells us she's thoroughly studied this topic.</li> </ul>
Trish Twijuke (Deborah)	<ul style="list-style-type: none"> <li>- I chose a higher rating because I skimmed over the background of Abby Langer and I saw that she has been a nutritionist since 1999. I believe that this makes her source far more credible not only because she is a specialist in the study of nutrition, but she also has been doing it for a while so I would assume that she knows what she's talking about.</li> <li>- Another point is that this wasn't posted that long ago, as it was posted in October of 2019, meaning that the research that is compiled on the blog post must be fairly recent.</li> <li>- Another point is the fact that she includes research and studies and the results from these studies that show that her information is backed up on research.</li> </ul>
Nicholas Rutenberg (Phil)	<ul style="list-style-type: none"> <li>- The only reason that I wouldn't put an 100 is because she is one person that I do not know and from what I could tell she works privately which makes me less inclined to use her as a source.</li> </ul>
Ava (Anna)	<ul style="list-style-type: none"> <li>- it appears to be a self made blog</li> <li>- does not seem to be backed up by any well known sources</li> <li>-there are some sources how ever this article is her own interpretation of the information</li> <li>- there is a section explaining her reasoning and it does appear to try and persuade others to live a balanced live with a healthy life style</li> </ul>
Lily (Florence)	<ul style="list-style-type: none"> <li>-It is a blog</li> <li>-Only the person's opinion</li> <li>- It does not belong to a website that is verified</li> </ul>
Elliot (Anthony)	<ul style="list-style-type: none"> <li>- one of the reasons I think this is trustworthy is because Abby Langer was a Registered Dietitian since 1999. Educated at Dalhousie University in Halifax, Nova Scotia and Loyola University in Chicago</li> </ul>
Nicolas Cotrut (Vince)	I chose this because it seems to be a blog from some person with no reputation.
madeleine chevrier (Brit)	<ul style="list-style-type: none"> <li>-Abby Langer is a verified and credible blogger. She has been a Registered Dietitian since 1999. Educated at Dalhousie University in Halifax, Nova Scotia and Loyola University in Chicago, Abby has worked extensively both in nutrition management and in clinical nutrition.</li> <li>- verified on Instagram with over 50K followers</li> <li>- recently updated(2019)</li> </ul>
Ashok (Adam)	. It's a blog, so you can't really trust what one person says.

. A lot of adds,. Maybe they just made the website for money.
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### Pre-Test Source 2

	- The website is from CTV news which is a trusted news network that many people know about. We know this because CTV is part of the Trust Project which makes sure websites are transparent, reliable, factual and accurate
Jill	<ul style="list-style-type: none"> <li>- They also link their resources in the article to allow people to see where they got their information from</li> <li>- The article is written by a dietitian</li> </ul>
Andrew	<ul style="list-style-type: none"> <li>-comes from a well-known source CTV</li> <li>-provides where they got their info from</li> <li>-contain's many ads for stuff that have nothing to do about the topic</li> </ul>
Deborah	<ul style="list-style-type: none"> <li>- Again, because this is an established well-known company, I am way more inclined to trust them as a source as opposed to singular sources and people who work by themselves.</li> <li>- The only thing that I would point out is the fact that they didn't link any resources or sources at the end of the post from their information. As this would show that their information is backed up by scientific data.</li> <li>- Another reason that this source could be deemed as trustworthy is because CTV News is apart of the Trust Project. All this information can be found when you click on the link attached at the end of the post titled: "why you can trust CTV News". The Trust Project aims to inform the public so they can make informed news choices. This makes the source appear more credible because of this.</li> </ul>
Phil	<ul style="list-style-type: none"> <li>- well known source</li> <li>-mathematical reasoning and explanation</li> <li>- domain is (.ca) meaning it is approved by the Canadian government</li> <li>- exact date of publication is provided</li> </ul> <p>-lots of factual information and citing sources</p>
Anna	<ul style="list-style-type: none"> <li>- trustworthy cite</li> <li>- heavy data</li> <li>- appropriate language</li> </ul>
Florence	-Its the news
Anthony	-It sources the american cancer society(which is a source made by trusted information)
Vince	- This is trustworthy because CTV news has been a very credible source for a long time
Brit	<p>I chose this rating because I know that CTV is a well know news reporting agency, though they are media, so they aren't completely trustworthy, because their intentions are to attract attention.</p> <p>Written by a random lady with no known degree in degree in Dietitian or anything similar</p> <p>None of the information is a primary or secondary source iots is all according to what someone else said about someone else said</p> <p>not a credible source</p>
Adam	<ul style="list-style-type: none"> <li>. It's a news website</li> <li>. It has all the research linked.</li> </ul>

### Pre-Test Source 3

	<ul style="list-style-type: none"> <li>- I've never heard of the BCRC as it is no very well known and therefore, may be unreliable and/or biased</li> <li>- They links their references and where they got their information from</li> <li>- The article expanded a lot on their research</li> </ul>
Jill	<ul style="list-style-type: none"> <li>- It is a biased article stating that meat is good for you but doesn't talk about any of the negative affects</li> </ul>
Andrew	<ul style="list-style-type: none"> <li>-Contains good info</li> <li>-Website is well organized</li> <li>-Doesn't have ads</li> </ul>

	-puts sources from where they found their info.
Deborah	<ul style="list-style-type: none"> <li>- The fact that the people who contributed to the preparations of the page are mentioned at the bottom of the page, increases the credibility of the page. For example, Karine Barlow (RD), Joyce Parslow, Canada Beef, and Dr. Benjamin Bohrer, PhD, from Oklahoma State University who contributed to this page in particular.</li> <li>- We can also see that the people who are credited to the page are people who have appropriate credentials. Like, Karine Barlow who is a registered dietitian which shows that not only is her contribution important but it is credible and might be backed up by her previous work.</li> <li>- Although, because this website isn't well known to me at all.</li> </ul>
Phil	<ul style="list-style-type: none"> <li>- (.ca) Domain</li> <li>- A large portion is just facts rather than interpretation of facts</li> <li>- The site's main purpose is research of beef and cattle</li> <li>- not a lot of cited sources presumably because they conducted their own research</li> <li>- not very well known</li> </ul>
Anna	<ul style="list-style-type: none"> <li>- credible sources</li> <li>- appropriate language</li> <li>- proper facts</li> </ul>
Florence	<ul style="list-style-type: none"> <li>- There is no real reasoning and it does not talk about long term effects</li> <li>- It is written by a PhD which helps with credibility and also Oklahoma State University which are two credible sources</li> </ul>
Anthony	Because their website and company is focused on researching beef cattle.
Vince	I chose this rating because this looks like a group of people with a slight background in this section is writing this, although they have a non-existing reputation so I'm not completely sure.
Brit	<ul style="list-style-type: none"> <li>- recently updated</li> <li>- references a lot of credible sources</li> </ul>
Adam	<ul style="list-style-type: none"> <li>. No ads, meaning they didn't only make this website for money</li> <li>. Information makes sense</li> <li>. Looks nice and trustworthy</li> </ul>

### Post-Test Source 1

Florence	I chose this rating because it gives a lot of information about the topic, in addition the resource was reviewed by dieticians from Dietitians of Canada. It gives both the positive and negative of the topic and it explains how in some cases when a small amount is used it can be safe. The source is also relevant because it was released in January of 2022. This means that the source is using recent research to prove their research.
Andrew	-if you click on about us it tells you that this website is an award-winning website brought to you by the dietitians of Canada. To win an award it must mean they're a very well-known and credible source.
Jill	<ul style="list-style-type: none"> <li>- This article has last been updated January 17, 2022 meaning that it has been up to date with new research or findings and is still relevant/useful to us today</li> <li>- The article was written and has been reviewed by dietitians from across Canada though it has not stated who they are. There is a possibility these dietitians can be biased on certain things</li> <li>- The article is from a trusted publisher such as the dietitians of Canada</li> </ul>
Evan	<ul style="list-style-type: none"> <li>-The document was written by a dietitian whose job is to study different foods and properties and how they affect your health</li> <li>- Had tables and other forms of showing information rather than keeping it in one paragraph.</li> <li>-There weren't any sources listed</li> <li>-Each paragraph was small.</li> </ul>
Deborah	- I already don't know much and have never heard of UnlockFood and the website provides little to no real details or information about where they get their information or about who specifically writes their articles.

	<ul style="list-style-type: none"> <li>- They just write that the article was written by dietitians from Dietitians of Canada, which is a community of dietitians in Canada. The website UnlockFood is actually brought to us by Dietitians of Canada. It would have been better if they had mentioned each person who contributed to the article.</li> <li>- Another issue is the fact that the article mentions no sources not even throughout the entire article. I don't consider sources completely necessary if they're getting their own information from their own research (seeing as UnlockFood is a website brought to us by dietitans, this might be the case.), but the information would appear more factual if you have multiple sources to back it up to show that others share the same opinion as you or received the same results as you.</li> <li>- However, because this is a more medical centered website, their information does hold a lot of weight to it because of the question we are asking. Because we are inquiring about diet and are going to pass on information to the "school board". It's important that we are getting information from people who specialize in nutrition, such as dietitians and nutritionists. As, this is run by Dietitians of Canada, their information and input is very relevant, as this is a discussion surrounding diet and we are in Canada.</li> <li>- Additionally, it was uploaded very recently.</li> </ul>
Anna	I chose this rating it gave detailed information and was credited as it was looked over by dietitians in Canada. As well as the fact that it had the date it was published and the author. Although the URL may not be as credible the information made it more reliable.
Vince	It has a twitter link at the bottom with a good following, meaning people read and support the organization
Anthony	<ul style="list-style-type: none"> <li>- The article is really up to date it was last updated on January 17, 2022</li> <li>- The website is based around food, not just some random website</li> <li>- no random ads</li> </ul> <p>- gave alternative solutions</p>
Adam	<ul style="list-style-type: none"> <li>- It makes sense</li> <li>- its nice,</li> <li>- It looks like they put a lot of work in making it</li> <li>- There is no Arthur</li> <li>- All the documents are written by dietitians</li> </ul>
Phil	<ul style="list-style-type: none"> <li>- reviewed by dietitians of canada</li> <li>- url is .ca</li> <li>- no ads</li> <li>-well organized</li> <li>- lots of raw data</li> </ul>
Brit	<ul style="list-style-type: none"> <li>- very well organized and easy to read</li> <li>- recently update(jan 2022)</li> <li>- from canada so relevant</li> <li>-tralks abotu pros and cons of it</li> </ul>

## Post-Test Source 2

Florence	It can be informative however because it is a scientific research about the product so it definitely gives real research, however it does not give any other view than their own.
Andrew	<ul style="list-style-type: none"> <li>-this source summarizes information from other sources.</li> <li>-it shows who wrote the info from the other sources and includes a link.</li> </ul> <p>-shows that they've studied this subject.</p>
Jill	<ul style="list-style-type: none"> <li>- There are many sources that have been cited in this paper</li> <li>- The formation of the resource is very heavy (a lot of writing formatted very close together). Its hard to find the information personally</li> </ul> <p>- We don't know where the article comes from (publisher)</p>
Evan	-The article was written by someone in the Heartland Consumer Products.

	<ul style="list-style-type: none"> <li>-There are at least 20 sources</li> <li>-The sources consist of organizations/companies that focus on Dietary Health and information on foods. Example of these organizations would be WHO, EFSA, IARC and LNCS.</li> </ul>
Deborah	<ul style="list-style-type: none"> <li>- I put this rating because I feel that the intent for this article may be a bit skewed.</li> <li>- Firstly, compared to the first website, Health Consumer Products (the publisher/ the company listed at the end of the pdf), presents multiple sources and different information that are on the topic of artificial sweeteners, which is good because it shows that other people have come to the same conclusion that they are trying to present.</li> <li>- However, the main problem with the pdf is not the actual pdf or the information listed on it. It's Health Consumer Products. Because Health Consumer Products has a lot of artificial sweeteners and sugar substitutes for sale and the information is provided by the manufacturer for Splenda, a very popular sugar substitute, they present the idea of the safety of using artificial sugar substitutes. This shows that they are automatically biased because they are trying to sell a product tied to the topic and therefore they are presenting their information in a way that may entice the audience to buy their products rather than presenting unbiased information.</li> <li>- Because of this, the source automatically becomes very unreliable for me and I wouldn't use this information at all to answer the question as to whether artificial sweeteners should be used.</li> </ul>
Anna	I chose this rating for this site as per the fact that initially when opening the link it opens to a drive and not a URL. It made it seem as the paper was written by someone who is not qualified to complete this type of writing. Although at the same time there were many credited sources as well as the proper publishing house at the bottom of the paper.
Vince	I gave this good rating because Splenda makes these sweeteners, and they would know very well about them, though they might have bias because of the same reasons.
Anthony	<ul style="list-style-type: none"> <li>- It was a science report with maybe some good data but there were way too many words</li> <li>- I couldn't find the author, publisher nor the published date</li> </ul>
Adam	<ul style="list-style-type: none"> <li>- No author</li> <li>- It's a PDF</li> <li>- The page looks nice</li> <li>- they have the links they used to research</li> </ul>
Phil	<ul style="list-style-type: none"> <li>- poorly organized</li> <li>- not a lot of contrast in sources</li> <li>- Splenda is a company that sells artificial sweeteners and so they are trying to mitigate the risks and are trying to both persuade, convince and sell me that I want this.</li> </ul> <p>url ends in .ca (however may just be Canadian branch of the site and not truly endorsed by Canada)</p>
Brit	<ul style="list-style-type: none"> <li>- not well organized</li> <li>- it has the opinion of professional science experts</li> <li>- talks about every opinion and every point of view</li> <li>- pdf</li> <li>- talks about all the effects of artificial sugar on almost everything</li> </ul>

### Post-Test Source 3

Florence	This source is not written by an expert which means it is not the most relevant, this is also a blog and no dieticians have looked this over. In addition this source was posted in 2017, so much has changed from then until now in science therefore we cannot trust those sources. Although the sources the author uses are good sources, they are not relevant to the time because the research was done from 1999 to 2012 which is not relevant to the time.
Andrew	<ul style="list-style-type: none"> <li>-contains many ads which have nothing to do about the topic.</li> <li>-The person who wrote this article hasn't studied her subject.</li> </ul>

	<ul style="list-style-type: none"> <li>-The person who wrote this article writes many different articles that have nothing to do with artificial sweeteners, meaning she doesn't only do research on one topic.</li> <li>-Contains links to other articles which had nothing to do with the topic.</li> </ul>
Jill	<ul style="list-style-type: none"> <li>- It is from a trusted new publisher</li> <li>- It is written by one person who may not be a dietitian who specializes in health</li> <li>- There is no evidence to support the side affects of artificial sweetener being in these foods and consuming them</li> </ul>
Evan	<ul style="list-style-type: none"> <li>-Doesn't have many sources</li> <li>-Doesn't backup their claims</li> <li>-They have ads after every paragraph</li> </ul>
Deborah	<ul style="list-style-type: none"> <li>- One thing that makes this source stick out as reliable, compared to the others is the fact that I recognize the publisher, Women's Health Magazine.</li> </ul>
Anna	I chose this rating for this site as I found that although that it is a known source by many people I found that for the type of research that was necessary it would not be as credible. Contrary to the point I just made I also find that the information was clear and was backed up with cited points.
Vince	This is a website which I also believe is pretty reliable, because it is based around informing women on health options. So I would best assume that this website would have correct information and have the best intentions for women. Though at the same time it isn't a website I know too much about.
Anthony	<ul style="list-style-type: none"> <li>- The topic was related to our topic but wasn't exactly ours</li> <li>- The website only talks about health</li> <li>- Not up to date it was last updated on July 12, 2017</li> <li>- The website tries to sell other articles to you</li> </ul> <p>- The information was good</p>
Adam	<ul style="list-style-type: none"> <li>- the things they say sound reliable</li> <li>- There is an author</li> <li>- They added the links they used to research</li> <li>- it's was written in 2017</li> </ul>
Phil	<ul style="list-style-type: none"> <li>- decent amount of sources</li> <li>- url is .com</li> <li>- relativly well known site</li> <li>- variety of sources</li> <li>- authro has no education in nutrition but has been a journalist and has been working on nutrition and food for over 20 year (Lots of experience)</li> </ul>
Brit	<ul style="list-style-type: none"> <li>- not very relevant</li> <li>- old, dated back to 2017</li> <li>- doent really talk about the medical side</li> <li>- says that its bad for you but doesnt back it up</li> <li>- only oint point of view</li> </ul>

## Appendix D: Email Responses

### Pre-Test

	<p>Dear school committee,</p> <p>I believe that we should keep red meat in our school lunches. There has been no enough data/research to allow for uncertainty or health concerns of eating red meat. In fact, there are quite a few, of consuming red meat such as many nutritional vitamins. Although there have been links between coronary heart disease and ingesting red meat. Although, like with everything, moderation is key. We need to make sure that the cafeteria serves unprocessed meat instead of processed. This is because processed meat is more unhealthy as it is full of salt and unhealthy preservatives whereas unprocessed meat is proven to be healthy and nutritious (in moderation of course).</p>
Jill	<p>Thanks, and I hope this helps your decision.</p>
Andrew	<p>Hello, school committee, hope all is well.</p> <p>Regarding the topic of having red meat on the school menu, I suggest we add it. Red meat gives us many essential nutrients such as iron and zinc. This would benefit the students as red meat helps keep your red blood cells healthy, the zinc in it helps build up your immune system and the protein in red meat will help build your muscles and bones. Hope you can understand the benefits of red meat and adding it to the menu.</p>
Deborah	<p>Thank you,</p> <p>Good Afternoon School Committee,</p> <p>I would like to address and put my two cents into the recent developments with the school lunch, regarding the decision to add red meat onto the school lunch diet and program. I would like to advise against the addition of red meat into the school lunch program. Recent studies show a link between an increase in coronary heart disease being present later in life and the consumption of beef, lamb and pork. With an increase in the consumption of said meats proportionally increasing the chance of the presence of coronary heart disease later on in life. Although red meats and beef provide essential proteins for a healthy diet among the students. Protein can be found in other food items such as poultry and beans. Poultry, such as turkey and chicken doesn't appear to hold the same link with heart disease that red meats hold. To conclude, I believe that there are healthier ways that students can get protein into their diet, that also decrease their chances of adopting heart diseases in the future, that can be implemented into the school lunch program.</p>
Phil	<p>Thank you so much for listening,</p> <p>To whomever it may concern, this email is in regards to red meat being served on the school menu. My advice is that red meat be served on the menu at a weekly basis. It has become clear to me that too much red meat is dangerous as it can cause fat deposits on the arteries that carry blood to the heart. However multiple sources agree that when eaten in moderation and with a mixture of other foods red meat does not pose a large threat. Therefore I suggest to you that red meat is only served once a week to those who want it with a viable replacement (such as a salad or sandwich bar) for those who would not wish to indulge. In summary: red meat should be served once a week along with another option as red meat is only safe when consumed in moderation and with other low sodium foods.</p> <p>Best Regards</p>
Anna	<p>Dear School Committee,</p> <p>I hope this email finds you in good health. I am writing to you to address a few major concerns I as well as many others have based off the red meat selections on the menu. Although, the children may enjoy having the opportunity to eat the hamburgers and steaks that they enjoy, I find that it is irresponsible to have not done the proper research to address the concerns about the red meat production from the school. From the thorough</p>

	<p>research I have done I have learnt that although it is an easy and delicious meal to make it has many healthy deficits in the long run for the children. Please let me know that you have received my email and will consider looking into the menu for the health benefits of these children.</p> <p>Thank you,</p>
	<p>Dear school comitee,</p> <p>I hope this emails finds you well, on regards to if we should be able to serve red meat in school, I do not think that serving it would be a problem because there can be some nutritional benefits. However, I do believe that there needs to be balance in the diet which the school is giving to the students. Therefore, there should not be too much red meat being served. I think that serving red meat once a week is a good balance nutrition wise, because it does have lots of protein and also lots of iron.</p>
Florence	Sincerely,
Anthony	<p>Good morning LCC committee. I am writing you this email to talk to you about red meat being served in our school cafeterias. I think that we should keep serving red meat in our cafeterias because the beef council research council said that "Beef is a complete protein, and a valuable source of key nutrients like iron, zinc, and vitamin B12. These nutrients are essential at every stage of life"</p> <p>thank you</p>
Vince	If I were to email the school committee to tell them about red meat on the menu, I would mention that it is fine to a certain extent, and that have a balanced diet is always the most healthy.
Brit	<p>Dear LCC school committee</p> <p>Eating red meat is a problem and having it in your meal plan should not be allowed. Eating red meat regularly can lead to a higher risk of heart disease. Red meat consumption and heart disease is because of the saturated fat that is present in red meat. Red meats generally have more saturated fat than other sources of protein, like chicken, fish, or veggies. Eating high amounts of saturated fat and any amount of trans fat can raise a person's cholesterol levels and increase their risk of heart disease. People should limit the amount of red meat they eat. Red meat beginning the menu is slowly killing the children at our school and is why we shouldn't have it on our menus</p> <p>Thank you</p>
Adam	A lot of websites are just created to make money but there are others that are there to inform people.
Steven	<p>Good afternoon school committee, I am writing you today concerning the red meat on the menu. I've recently been reading up on the effects of eating red meat and not eating enough red meat. What I have found is that we should not cut out red meat from the student's diet but we should not eat too much of it. In an article by CTV news I found out that eating meats can raise chances of having heart attacks. In an article written by BCRC it said that eating red meat is important because of vitamins. So I think we should have some red meat on the menu but a lot of other stuff as well. In addition I think we should try as much as possible to try and not use processed meats.</p>

## Post-Test

	<p>Hello,</p> <p>I hope this finds you all well, regarding the questions of if we should or should not have artificial sweeteners, I believe that we should not, because there are so many negatives about putting these unhealthy substances in our bodies. Although health canada says that artificial sweeteners are safe it is important to also understand that children should probably stay away from them, which is why I believe that it would not be the safest idea for there to be artificial sweeteners on the menu.</p>
Florence	Sincerely,

	<p>Hello, school committee, I hope all is well.</p> <p>I'm emailing you about the decision of whether we should add artificial sweeteners to the menu. After doing research my answer is no, they should be avoided when selecting the menu. If you are to do research on why artificial sweeteners are bad it shows that they can lead to weight gain, brain tumors, bladder cancer, and many other health hazards. These reasons are why we should not add artificial sweeteners to the menu.</p>
Andrew	<p>Best regards,</p> <p>Dear school committee,</p> <p>I understand that you are concerned about having artificial sweeteners in the menu, but I wouldn't stress over them. While artificial sweeteners are not the healthiest option, incorporating small amounts into a well-balanced diet is okay. Health Canada regulates all the sweeteners that are used and sold in Canada meaning that there should be no worries about the production of them. However, there have been studies done that link artificial sweeteners in unhealthier foods such as diet sodas, candies, desserts etc., that can lead to increased cravings, belly fat and even a change in how we taste food. With that said, the best thing to do is to make sure the school lunches provide a healthy, balanced diet to the kids. We just must make sure that food containing artificial sweeteners do not replace nutritious foods as they will always be more beneficial.</p>
Jill	<p>Thank you for your consideration!</p>
Evan	<p>In my email, I would mention how there are many articles explaining how artificial sweeteners, if not controlled, can be detrimental to your health. I would inform them how multiple famous organizations such as WHO and others like it have stated how artificial sweeteners can increase your chance of getting diabetes and sickness similar to it. However, artificial sweeteners are safe if they are consumed in moderation. Therefore, my message to the school committee would be to moderate the use of artificial sweeteners.</p>
Deborah	<p>N/A</p> <p>Dear School Committee,</p> <p>I hope this email finds you well. In my recent observations and research I have been able to come up with the idea that having beverages and meals with artificial sweeteners on the menu not to be in the best intention of the students. Although it is proven to be safe for all ages of children, we mainly as the school as you know have been trying to incorporate more of a balanced and nutritious meal plan for the students throughout their days learning. Although not much has been stated, I would love to hear what you as the school committee have in mind regarding artificial sweeteners on the menu at school. Please get back to me in the best interest of the students.</p>
Anna	<p>Thank you,</p> <p>Dear School,</p> <p>I would like to inform you about artificial sweeteners which you potentially may have in your menu. Simple foods such as bread and sauces like ketchup might have artificial sweeteners which may not be the best for our health. If possible, changing the menus to limit unnecessary threats to our health would be the most ideal. Healthy or not, not taking a risk with the food is the best idea.</p>
Vince	<p>Thank you,</p>
Anthony	<p>Hi LCC committee this email is regarding the artificial sweeteners in our school lunches. After doing my research it is ok to keep artificial sweeteners over sugar just not for everything.</p>
Adam	<p>Email:</p>

	Hello, I'm a grade 9 student named Ashok Krishnan and I wanted to advise you that many food companies are now adding artificial sweeteners instead that real sugars and it could be unhealthy. Foods such as ketchup, whole wheat bread and Greek yoghurt all contain artificial sugars. So keep in mind.
Phil	Dear Lcc meal committee, I hope this message find you well I am emailing you to inform on my opinion on having artificial sweeteners on our menu. After my research on three different source I have come to the conclusion that there is no harm in having sweeteners on the menu as long as they are properly regulated. While there are certainly far fewer health risk than regular sugar, sweeteners such as Splenda do still partially affect mood and nutrition. Therefore it is my recommendation that we switch out regular sugar for artificial sweetener without increasing how often they are served so as to maintain normality.
Brit	Dear LCC school committee, I'm emailing you to talk about having artificial sweeteners on the menu. Did you know that ketchup had artificial sweetener in it?, well it does. Just one pack of ketchup isn 40% of your daily value of artificial sweeteners, meaning if a student eats 3 packs its might cause Gas/bloating diarrhea and stomach upset. It is recommended that children avoid sweeteners. Foods and drinks with sweeteners may replace other more nutritious foods like fruits and veggies. Read the ingredient list on foods like yogurt, cereals and cookies (which are all sold at lcc) that may contain sweeteners. I hope you take of every item thta has artificial sweetner, so it doesnt take away the real nutrisciuos foods from the children lives.

## Appendix E: Ten Days Assignment

# Ten Days that Shook the World

History is full of events that would have a lasting effect on how the future would be shaped. For this project, you will focus on 1 event of your choice and you will be responsible for explaining the event and why you believe this is one of the most important events in history. This project will be completed in multiple steps and will ultimately be completed in a variety of formats.

### Requirements

- You will analyze **one event or day** of your choice between the years **1500-2012**.
- You will complete a detailed source analysis on a **minimum** of 4 sources.
- You must have a **minimum** of **2 primary sources** and **2 secondary sources**.
- An **outline** of how you plan to present your findings.
- A final product in the form of your choice that
  - Explains what your event is. (Include any important historical figures, dates, geographical locations etc)
  - Outline **3 clear reasons** why your event is the most important event in World History.
    - Must be supported by the research that you found.
- A proper bibliography in MLA format.

### **Step 1:**

- Pick an event you believe is important to world history and develop an inquiry question.
  - E.G-> How have the geographical and political impacts of the Race for Africa changed the world's outlook today? Or How has September 11, 2001, shaped the political and cultural landscape today?

### **Step 2:**

- Begin researching your topic. You will be responsible for completing a detailed source analysis of at least 4 sources. (This will be assessed in conjunction with your final product)
  - 2 Sources will be done using the CORE method.
  - 2 Sources will be done using the OPCVL method.

### **Step 3:**

- Create a short outline of how you will present your findings.

### **Step 4:**

- Finish up the final product that demonstrates what you believe is the most important event in World History.

### **Important Tips:**

1. When picking an event, make sure it is a specific event. **World War 2** is too large of a focus. You can pick a particular moment during World War 2, e.g Hiroshima. This will be easier to defend.
2. Be sure also when thinking of your **event** you want to think of the **consequences and effects** of this day on the rest of our history.
3. The final product can be completed in a format of your choice. This includes the following: Podcast, Infographic, Written Essay, Rap Battle, Video Presentation, Poem, Speech, etc.
4. Be sure to pick sources with different perspectives on your chosen event. This will give you a more holistic view of your topic

### **Potential Events (you can choose ones not suggested here):**

Hiroshima	The Reformation	Invention of the Printing Press	September 11, 2009	American Revolution
Canada's Confederation	French Revolution	The Invasion of Poland 1939	D-Day	Colombus "Discovers" America
Invention of the Steam Engine	Invention of Penicillin	Fall of the Berlin Wall	Invention of the Internet	The Emancipation Proclamation
Newton's Law of Motion	The Exile of Napoleon	The Russian Revolution	Darwin's thesis on evolution	Opening of the Suez Canal
The Berlin Conference and division of Africa	Suffragette Movement	The first airplane flight	The Treaty of Versailles	The Stock Market Crash

## Appendix F: Student Responses for Ten Days Assignment

### OPCVL Sources

Phil		Scores using CORE rubric
Source-> Time Magazine	The origin of this source is a news source called Time. The author is Albinko basic. He is a history graduate from connecticut. His articles are all history related and often centered around eurasia. The purpose of the article is to inform. It tells the story of how and why the wall was created and the series of events that lead up to the mass crossing at Checkpoint Charlie. The article uses primary source images to convey the events that were occurring. An image of a couple talking to a family in an apartment building across the wall. Images from checkpoint charlie during the crossing and some others. The value of this source is that it breaks down the series of events directly before and leading up to the fall of the Berlin wall. However due to this it doesn't truly go into detail about its consequences and causes. However I now have a very detailed scout of the actual event and can use this to better surmise what happened and find another article discussing the impacts of the wall.	8 points
Source 3-> Britannica	The origin of this source is Britannica as well as a number of different authors. They are all registered members of the editors of Encyclopedia britannica. Their qualifications range from journalism degrees to historical majors. The purpose of the article is to answer commonly asked questions like Why was the Berlin Wall built? And What was the "death strip"? There are also other facts about the wall and the symbolism it carried as it divided families, democracy and communism, east and west. The article aims to give an explanation as to what the wall meant and dispel common misconceptions about the Berlin Wall. The content is strictly Berlin wall related. There is very little connected to the cold war and tensions between the US and USSR however there are many connections to other sites and videos that can be used for further research.	6 Points
Brit		
Source	"The Economy and the Internet: What Lies Ahead?" was written by Alice M. Rivlin and Robert E. Litan on December 1 in 2001, published by Brookings.	10 points

	This article was written to inform readers about the economy, the internet and what might happen. It informs you about The Economic Potential of the Internet Revolution. The authors go into detail about all the ways the internet can influence productivity growth. The main idea of this article is the way that the internet affects economic growth. It explains how the internet can increase productivity growth in various ways. The author is predicting most of what's going to happen and how it can in the article. So there is no real way to tell if all of this information is reliable or if it will really happen. This article was written in 2001 and is talking about the future which limits them to only knowing what's going to happen in the present.	
Source	“The Role Of Technology In The Evolution Of Communication” was written by Sol Rogers on October 15 in 2019, published by Forbes. This article is written to inform people of the evolution of communication. This article goes into detail about the telephone, the internet, emailing and even wearable technology. The author is mainly just stating facts about the evolution of communication so there is no obvious bias shown. The author does not show an opinion which limits their information and article. This article is also limited because it was written more than two years ago and communication and the internet changes quickly.	8 points
Adam		
CNN	It explains about how Yuri Gagarin became an astronaut, and the impact it took for Russian Air Force and competition with the American space industry.	1 points
Florence		
Source-> History.com	The origin of this document is History.com. The purpose of this source is to educate people about the atomic bombs that were dropped on Japan. The content is that the source gives information about the bombings on Japan during the second world war. These two bombings were considered the end of the war. The source gives information about when the bombs were created, and how they were created. In addition it gives the information to how it got to the point where the USA believed the bombing was crucial. The valuable parts of this source/ what we as readers can learn is that the atomic bombings had a big impact on both countries and many people were sacrificed for the end of the war. Although there is lots of information there are limits to this source because this is a secondary source therefore we are not given much information of the victims families. And there was no one who	6 points

	wrote this article that was directly there when this bombing happened or when the bombs were created.	
Source->Atomic	The origin of this document was from July 17 to August second of 1945. The purpose of this document was the terms and conditions to end world war II, for the japanese. This document contains information for the terms and conditions of the president from England and other ally countries for Japan to surrender from the war. The value of this source is that this is part of the document that ended world war II therefore this is a very valuable document because it ended the worst war ever. The limits of this source is that there is nothing written from anyone but the Ally countries therefore we are not able to see the point of view of the Japanese president or what he believed for the conditions to be.	6 points
Vince		
Nasa	<p><b>Origin:</b> The author of this document from Nasa's official website is Shelley Canright along with Brian Dunbar. This page was last edited and published April 9, 2009.</p> <p><b>Purpose:</b> The intended audience for this document is from all grades, as the Nasa website has K-12 versions, though in my version, the document was intended as an official historical document of ages approximately 14 and up. It is meant to inform the audience using factual data, and isn't trying to persuade or present an alternative point of view for the audience to read.</p> <p><b>Content:</b> In this short document published on the official website of NASA, the main idea that they were trying to convey to the readers was a general explanation of the events that occurred outside of our world in July of 1969. We learn that Neil Armstrong was the first man in space, soon followed by Buzz Aldrin. They stepped on this surface for the first time in human history, and took some samples, and did experiments on the moon for three hours, while leaving their mark on the moon with a flag of the United States of America. Though we also learn a few other details about the flight including their ship name, being the Apollo 11, and that their head pilot was Micheal Collins. Forming the most legendary astronaut trio of all time.</p>	<b>6 points</b>

	<p><b>Value:</b> This source helps answer my research question mainly because, as a first source to use for this project, it gives me a general background knowledge on the events of July 1969 in space, and I get to learn a bit about what happened, and who was involved.</p> <p><b>Limitations:</b> This source raises a few questions in terms of information that I would like to know for this project. The most important one was, what kind of experiments did NASA attempt on the moon, and had they hoped to achieve a goal from these experiments. For example, inhabit the moon itself? This source doesn't conflict with another source for now, and the point of view wasn't necessarily balanced or unbalanced.</p>	
CSM Monitor	<p><b>Origin:</b> The author of this website, called Christian Science Monitor or CsMonitor, is Eva-Botkin Kowacki. The article was last edited and published on July 16, 2019.</p> <p><b>Purpose:</b> The purpose of this website is mainly to inform people of about 10 years old and up, since any younger would be too difficult to fully comprehend. This article informs people of that age about the gravitude of the impact of the moon landing of 1969. This text is meant to inform, as it tells us the details of their trip, and the impact and aftermath of the landing, and to persuade because it is trying to persuade us into understanding why this is an incredibly important moment of modern history.</p> <p><b>Content:</b> In this source from CsMonitor, we learn a lot about the voyage of Apollo 11 and its struggles along the way. The departure of Apollo 11 was long awaited, and the world was anxious because of the previous missions which ended in disaster. The start went well, and they were safely in space, though as they approached the moon they encountered the biggest issue, they were running out of gas quickly, and the spot they were supposed to land on the moon was full of craters, so they needed to search for another landing spot. Obviously, this used up even more gas, which started getting the on Earth crew panicked. But their luck hadn't run out just yet, they had found a landing spot. As the entire world (600 million people) watched, the famous words, "That's one small step for man, one giant leap for mankind." This landing had not only broken the boundaries of space once more, but it had proved something important:</p>	<b>6 points</b>

	<p><b>Value:</b> This source helps me answer my research question mainly since to be able to answer my research question of how the landing of the first man on the moon was the most important moment of modern history because from this article, I learn the struggle of the trip to the moon and the background information surrounding this, but most importantly, I got a very important quote above which is in yellow, and is an important reason as to why this moment in history was so essential.</p> <p><b>Limitations:</b> This source that I read didn't raise any questions in regards to the subject, and this source doesn't conflict with my other sources. It has a balanced point of view as well.</p>	
Deborah		
	<p><b>Origin</b>  This article was written by Abigail Lebovitz. They spent 4 years at Stanford University studying for a Bachelor in Arts, Human Biology and spent 10 months working as a Research Technician at Massachusetts General Hospital. During the winter of 2016, Lebovitz was present for the Stanford course “Introduction to Nuclear Energy” and submitted a report entitled, “Chernobyl and its Political Implications” on February 18, 2016. This was for this course. This is considered a secondary source because within the article Lebovitz filters through information to present and evaluate the political implications of the Chernobyl Disaster.</p> <p><b>Purpose</b>  Because this was turned in for a course, the intended audience was probably the course teacher and/or their other classmates. However, because this was published publicly, the audience could also be anyone who is looking for information on the subject. This document exists as submitted coursework for the Stanford University course “Introduction to Nuclear Energy”. The intent of the document is to present the information of the political consequences of Chernobyl.</p> <p><b>Content</b>  The document talks about the political implications of the Chernobyl Disaster.</p>	<b>10 points</b>

	<p>The main idea of this source is that there are many consequences of the event, some environmental and health, and presents the political ones.</p> <p><b>Value</b></p> <p>We can tell that the author is using this document as a way to document and inform their audience about the political issues that were prompted by this disaster. The circumstances of the creation of this article was for coursework. We can see this reflected because of the text at the top of the page “Submitted as coursework for PH241, Stanford University, Winter 2016” alluding to the fact that this is coursework. The author presents an outsider point of view and doesn’t seem to have connections or ties to the actual event in question. During the time that this article was published, it would have been around the time of Chernobyl’s 30th anniversary.</p> <p><b>Limitations</b></p> <p>From this source, we can not tell the point of view from, say for example, someone who was and may still be affected by the event. If so, we may be able to pick information about the generational consequences of the event or some of the more directly affected people. Also, because this is a secondary source and it was turned in as coursework, the author wasn’t present for the actual event and therefore can’t tell us what the actual event was like for those who went through it. However, the author doesn’t present any sort of side for the argument and so I can concur that the evidence that they are presenting isn’t skewed or biased. What is purposely being left out is the environmental and health effects of the disaster but this was a decision made to keep the main focus of the document on the political effects.</p>	
	<p>(OPCVL)</p> <p><b>Origin</b></p> <p>The website doesn’t have a specific author linked or credited to the page and this is because this page is a government page. We can see this because the URL ends with “.gc.ca” which is representative of the government of Canada. The government of Canada is the body responsible for the federal administration of Canada. Because of this, this source automatically ranks high on credibility. The article is posted under the name of the Canadian Nuclear Safety Commission. The Canadian Nuclear Safety Commission is the federal regulator of nuclear power and materials in Canada. Because of this I know that the contributors of this page have the qualifications to add information on</p>	12 points

	<p>the topic. It doesn't have a created date but the date it was last edited was 2022-03-09.</p> <p><b>Purpose</b></p> <p>This document exists to address the health effects of the Chernobyl Disaster. I know this because this is a government website and generally government websites are used as an information outlet and present facts and statistics. The audience for this article is typically anyone who wants facts and statistics and basically laid out information on the topic of the Disaster. I can tell this because this is a government website and is very easily accessible, linked under the health studies portion of the website.</p> <p><b>Content</b></p> <p>As mentioned, the article is based on the topics of the health effects of the Chernobyl Disaster. This is how they organize the information. Firstly, the article presents multiple bullet point quick facts about the Chernobyl Disaster. Then, they go into a little bit of detail about how the actual disaster took place and what went wrong. Then, they go into each specific impact in detail and end the page with a brief summary and the citation of their sources.</p> <p><b>Value</b></p> <p>When creating my project, I wanted to tackle the three different areas of the effects of the Disaster, Political, Health and Environmental. I am using different sources to find information on these different areas. This is very important because it touches very heavily on the health aspect.</p> <p><b>Limitations</b></p> <p>I consider that a part we can not tell from this document is the actual reactions of the people involved and more personal accounts. Because this document mainly focuses on the statistics and the numbers and facts, we don't truly get an insight into the lives of the people affected by this event.</p>	
Jill		
	<p>(OPCVL)</p> <p><b>Origin</b></p> <p>This article was written by the editors of Encyclopedia Britannica and was published by Britannica on their website. It was last updated on August 19, 2022. It is a secondary source that analyzes the Treaty of Versailles (1912). Britannica is a highly reliable and trusted source</p>	8 points

	<p>meaning that we know that the information being published is accurate.</p> <p><b>Purpose</b></p> <p>Britannica; the publisher of the article, aims to be an excellent reference source and provide accurate educational material. The purpose of this specific article is to educate people about the Treaty of Versailles and everything surrounding it. The intended audience is mainly students and/or scholars to allow them to have accurate information on whatever topic they may be researching. Although anyone can access the information if they want to.</p> <p><b>Content</b></p> <p>This particular article talks about the Treaty of Versailles as well as information such as World War 1, The Paris Peace Conference, and other important information surrounding the treaty. It also includes information about Germany's perspective and how they were affected by the treaty. There are also many primary sources such as videos and photos throughout the article.</p> <p><b>Value</b></p> <p>The article is not written from a certain perspective on the Treaty of Versailles. It is meant to teach about this topic with an unbiased opinion and provide any viewers with accurate information.</p> <p><b>Limitation</b></p> <p>While the article includes primary sources, it is written from a research perspective and does not include personal experiences from that time period. There is not really any bias from the author.</p>	
	<p><b>Origin</b></p> <p>This source is a secondary source. It is an article written on an event, in this case the Treaty of Versailles. They include primary sources such as photos from the actual time period. There is no clear author stated, so it is presumed to be written by the United States Holocaust Memorial Museum. It was published on the Holocaust encyclopedia but there is also no publish date stated.</p> <p><b>Purpose</b></p> <p>The purpose of the article is to inform people on the Treaty of Versailles and how it ultimately led to World War II and many negative effects after the first World War.</p> <p><b>Content</b></p> <p>The document talks about how the Treaty of Versailles had many negative effects that ultimately led to the uprising of Nazism and the</p>	<b>8 points</b>

	<p>coming of World War II in the future. Specifically it talks about the background of World War I, background of the Fourteen Points, Provisions of the Versailles Treaty, and the Impact of the Treaty.</p> <p><b>Value</b></p> <p>The article is written from the Holocaust enclycopeida. This means that they are writing this from the perspective of what the Treaty of Versailles led to in World War II.</p> <p><b>Limitation</b></p> <p>Since it is a secondary source, it does not include a direct perspective from what people thought during that time period. The article can be biased about the reasons that World War II started such as the Treaty. It does leave out other reasons that Nazism and the second world war was influenced.</p>	
Andrew		
	<p>Origin: the origin is the author but in this site they're name isn't given.</p> <p>Purpose: To inform me on D-Day</p> <p>Content: This website's content contains information on d-day</p> <p>Value: Although the author isn't given this source is still very credible as it comes from history.com which is an extremely well known source and it's known to be credible.</p> <p>Limitation: the limitation of this source is that the author of it isn't given so we don't know they're experience with this topic</p>	<b>4 points</b>
	<p>Origin: this site's origin is the National WWII Meseum in New Orleans.</p> <p>Purpose: The purpose is to inform me on D-Day.</p> <p>Content: The content in this site is facts about D-Day and information on it.</p> <p>Value: Despite the author and the date published of this site it is still a very good site as the information comes from the National WWII Museum in New Orleans, this means the information in it came from someone who thoroughly studied this topic and the site contains evidence from WWII. Limitation: the limitation of this site is that the author isn't given meaning we can't do research on them to see where they studied and obtained their information.</p>	<b>5 points</b>

## CORE Method

Phil		Scores
Source-> Crash Course	This is a crash course video made by John green. It uses a variety of images that are mostly primary sources. They contain images from press conferences and memorable events like the Berlin airlift and many others. The video is meant to inform and entertain. However unlike the <i>oversimplified</i> video it does not aim to reach new audiences and so they put as much information as possible because unlike the oversimplified videos the viewers of crash course know that there will be a lot of detail and the events are not watered down to be easier to understand.	<b>6 points</b>
Source-> Oversimplified	The content of this source is a youtube video detailing the events leading up to the berlin wall. It is a very general overview of the cold war and it is helpful due to the fact that it explains the roles and points of view different leaders had. The video has many primary sources varying from quotes to images as well as secondary sources from scholars explaining different events and strategies that occurred during the cold war. The source is oversimplified on youtube. His real name is Stuart webster. The primary focus of his account is to entertain and inform. He has no need to pursue or sell due to the fact that his paid partnerships have nothing to do with his content and are purely based on infomercials placed at the beginning or end of his videos. The videos are meant to entertain and so they are meant to keep the viewers attention with humor and simple easy to follow information. The author is American and had an western upbringing. There is some bias in this video and so I must be wary not to forget that a good source has multiple different perspectives. It is also as the title suggests very oversimplified as it was simply meant to keep people entertained and not be used as a source in an article.	<b>8 points</b>
Brit		
	“The Impact of the Internet on Society: A Global Perspective” was written by Manuel Castells and was published by BBVA. This article discusses the impact of the internet on society, the rise of social network sites on the internet,, the network society and the culture of autonomy. This article makes logical sense and is high quality/credible. The author is highly qualified and is an expert in this field. Castells is a professor of Communication Technology and Society at the University of Southern California, which proves him to be credible and reliable. This article is very useful to answer my research question, but does have a lot of excess information, which still makes it moderately relevant. Overall this source is somewhat relevant, credible and reliable.	8 points

	<p>“Impact of Technology on Communication” was written by Hemangi Harankhedkar. This article discusses both the positive and negative impacts of technology on communication. This article is extremely relevant because it explains the direct impact of technology, but is slightly credible. This blog is written by parents who write blogs, who have an unknown level of expertise and aren't necessarily qualified to write the blog, which doesn't make the information very credible. This article is extremely relevant and useful to answering my research question because the whole meaning of it proves my point. This article is profianal looking, somewhat error free and well organized which makes it moderat credible.</p>	10 points
Adam		
Source-> Britannica	<p>Core method. Explains Yuri Gargarin life, explains how he got into space, how he became an astronaut, how he went to space and how he died.</p>	1
Source-> Nasa	<p>It explains the early life of the astronaut, how he grew up and how he went to space.</p>	1
Florence		
Atomic Hertiage	<p>The context of this source is that it helps answer my research question because it explains the effects of the hiroshima bomb on civilians and survivors. This text is relevant because it is a primary source that was made to tell the story of a photographer that got first hand pictures of the bombing as it happened. The source of this article is relevant because it is from someone who survived the bombing first hand, therefore he is very qualified to discuss the subject. The purpose of this article is to inform people and tell the story of someone who survived such a horrific event. This source does have multiple perspectives because it explains his perspective as a photographer however also the civilians that he was photographing. This source fits well with my understanding before reading the article because I knew how a lot of people suffered very badly and I had already learned about Hiroshima before reading this article. This cite is relevant because it discusses someones true experience about the topic therefore it is the view from someones eyes who actually survived the bombing.</p>	6
Khan Academy	<p>The context of this source is that it is credible to the genre of my project because it is discussing the bombing of hiroshima, and why it is so important to history. The information on the website is very error free and also very organized, there are different sections of the</p>	8

	<p>article that are divided which makes it look very put together and professional looking. The source is credible because the article is written by a professor in history which proves that he did his research well and he is a professional in his field. In addition, the author of the article sources all of the information in correct formatting, in addition the links he used were also written by credible sources. The content of this source allows me to answer my research question because it discusses why hiroshima is so important to history which is what I am looking for in my project.</p>	
Vince		
Colombia EDU	<p><b>Context:</b> This article from Colombia.edu, was published on the 17th of July in 2019, and written by Nicole Deroberts. This source was published exactly 50 years after the actual landing, which meant the moon landing was a while ago and had been thoroughly analyzed by the time it had been published.</p> <p><b>Source:</b> This source that I am analyzing is a relevant source in my opinion. It directly connects to my research needs as it talks about the reasons as to why the landing of the first man on the moon relates to my subject. It talks about background information about the subject, with precise reasons as to why exactly they say what they say. This source is also credible in my opinion as it is from a university research website called Colombia Climate School, and schools almost never have fake or unreliable information.</p> <p><b>Content:</b> In this website the main important information extracted was the following. Before the July 16, 1969 moon landing, scientists had no true field of planetary science, only a few scientists called themselves astronomers and studied worlds, though this was all theoretical science until then. So the moon landing had brought in a large community of scientists. The trip to the moon provided us with our first proper look at another spacial body. They made countless discoveries from this, some of them being that the moon samples came back as 3 billion years old. “We learned how violent and chaotic the earliest history of the solar system was. We wouldn’t have gained that perspective without leaving Earth.” All in all, the moon landing was a remarkable achievement in our technological history, and it is also a “giant leap” in the appreciation of our solar system.</p>	<b>10</b>

Medium.com	<p><b>Context:</b> This article, written on a public article posting website, was published on the 30th of June, in 2021 by a pHD professor of Geoscience. It is published 52 years after the landing itself. So its perspective on the subject, being the international impact of the Apollo 11 landing, takes into account all of the aftermath impact years later, unlike an article talking about the kanding 52 years ago right after the landing, which would have had very limited perspectives.</p> <p><b>Source:</b> I think this source's relevancy to the topic is very good, because the project talks about why the moon landing was as important as it was, and the international impact is exactly what i'm looking for. The credibility of this article is also very reliable in my opinion because it is written by an author who has a pHD in geoscience, and works at planetary labs, while having formerly worked at a Mars Recon organization. The best of the best surely wrote this article, and I completely trust it.</p> <p><b>Content:</b> As for the content of this article, the new information that I took from it was the following. The global impact of the moon was unquestionable, as it had nearly 600 million viewers, which was about one fifth of the global population at the time. The “Giant Leap” tour, which was a celebration of the event around 24 countries in 37 days attracted 100 million people. Nearly every country had released commemorative items and pins and coins, including countries from Australia to Malawi. The author Tanya Harrison and a fellow colleague searched the world in hope to find people who had watched the landing in person, and compiled the stories into a book, known as the “The Untold Stories of How the Moon Landing Inspired the World.” The stories came from 8 people ranging from a Lithuanian Holocaust survivor, to a sudanese engineer. This just comes to show that this changed the lives of many people in all corners of the world, and all groups and ethnicities.</p>	12
Deborah		
	<p><b>Context</b></p> <p>Rather than the other three sources, this information is presented on a PDF and book. There is a title page and a foreword. Additionally, there is an entire table of contents outlining the different number of various subjects and topics that this book will be on. Overall, the information is</p>	8

	<p>presented really nicely and professionally, which is expected because this is a book made by an international organization.</p> <p><b>Source</b></p> <p>The book is credited to the International Atomic Energy Agency. The International Atomic Energy Agency is an international organization that seeks to promote the peaceful use of nuclear energy, and to inhibit its use for any military purpose, including nuclear weapons.</p> <p><b>Content</b></p> <p>This book presents the Environmental challenges and changes that were catalyzed by the Disaster.</p>	
	<p><b>Context</b></p> <p>The information on this website is presented very well and professionally. The information is presented in sections and includes pictures and quotes as sources. The url type of this website is “.org”. The “.org” top-level domain stands for “organization” and is primarily used for nonprofit websites such as charities, NGOs, open source projects, and educational platforms. Showing that this website is used to educate. They don’t have any endorsements or advertisements present on this website.</p> <p><b>Source</b></p> <p>The Interpreter is a website made by the Lowy Institute that is an international website that offers commentary and analysis on international issues. John Carlson is the author of this specific article. Carlson was a member of the Advisory Board of the International Commission on Nuclear Non-Proliferation and Disarmament and is currently a counselor for the NTI (the Nuclear Threat Initiative, Washington) on nuclear non-proliferation, disarmament and verification issues. He is also a member of the Asia Pacific Leadership Network for Nuclear Non-Proliferation and Disarmament, Nuclear Fuel Cycle Royal Commission, South Australia and a Fellow of the Institute of Nuclear Materials Management. Because of all the above mentioned, I fully heartedly believe that John Carlson is fully certified and qualified to speak and inform on the issue of the nuclear Chernobyl disaster. John Carlson presents the evidence that the disaster contributed to the demise of the Soviet Union and may have also cost a chance to employ low-carbon energy. Similarly to the first source, this source presents the more political consequences of the Disaster. Carlson presents his facts and adds images and additional information to support them.</p> <p><b>Content</b></p>	12

	<p>Firstly, the article addresses that although the event happened multiple years (over 3 decades) ago, the effects of it are still present among us. Then, goes into detail about how the disaster happened and the effects,</p>	
Jaya		
	<p><b>Conext</b>  The text is about the effects of the Treaty of Versailles and how they led to World War I and other lasting problems. It is a well organized text. It includes links within the article and has different subtitles on what each paragraph is about. The URL also suggests that it is a secure website as it includes a lock showing a secure website. The website is History which is a trusted history website. It is very relevant to my research questions, as it specifically provides me with information on the effects of the topic.</p> <p><b>Source</b>  The author of the article is Sarah Pruitt and it was published on the website History. There is no point of view on the article or prominent bias in the article as it is just for informing people about the effects of the Treaty of Versailles.</p> <p><b>Content</b>  It includes information on the Paris Peace conference, the specifics of the treaty and its effects, as well as how that led to the second World War and maybe even the Great Depression. The main argument of the article is how the Treaty played a big part in making World War II possible.</p>	12
	<p><b>Conext</b>  This text is about the treaty of versailles. It is well structured and organized with general information surrounding the topic. It includes links within the article and other related articles below. It is a secure website and article as shown by the lock in the URL. The website is History which is a trusted history website. It is very relevant to my research question as it provides me with lots of information on my topic.</p> <p><b>Source</b>  The publisher is the website History.com and is written by the editors of the website. There is no biased point of view of the article as it is just for research about the treaty. It is meant to inform the readers on general information and facts on the topic.</p> <p><b>Content</b>  In the article it specifically talks about the Fourteen Points, the Paris Peace Conference, the terms of the Treaty of Versailles, and criticism of the treaty and other relevant information.</p>	10

Andrew		
	<p>Core</p> <p>Context: the context of this source is that it comes from a very reliable source as the person who wrote it is someone who has studied this topic, meaning he's looked at all the different perspective in order to give out this information.</p> <p>Content: The content in this article is solely information on D-Day, the author isn't giving his opinion on the topic and is remaining unbiased.</p> <p>Purpose: The purpose of this source is to inform me of the battle of Normandy/D-Day.</p>	4
	<p>Core:</p> <p>Context: This source's context is that it came form someone who studied this topic. Even thought they didn't live through it they still have evidence such as pictures and videos from D-Day and explaining it.</p> <p>Content: It contains information on D-Day such as the planning up to it and the day itself, like I also mentioned before it has photos from the day and Videos.</p> <p>Purpose: The purpose of this source is to inform us about D-Day and all the steps leading up to it and it's final outcome</p>	4
Total		

## Appendix G: Teacher Action Journal

Day 1: April 19, 2022

2 students are absent

Discussion Questions:

1. How often did students remain on task? (Engagement)
2. How often did students need clarification of the material and activities presented?
3. How often were students able to complete the material without needing clarification?
4. Were answers and discussions appropriate and relevant to activities?
5. Was CORE Language used in the lessons?

Good engagement with the material; however, students did need to be reminded to remain on task or avoid getting off-topic during discussions. Some students were clearly not on the right webpage and were getting distracted. 1 student was not participating in the activity at all.

Most students understood today's activities, but there was some confusion with the pre-test expectations. Students needed to be reminded to complete the pre-test individually and some did work with the person beside them which may skew the results.

Answers were appropriate to the discussions. Many students talked over one another during the pizza discussions. The classroom was quite loud.

Day 2: April 20, 2022

2 Absences

No Internet so had to improvise

Discussion Questions:

5. How often did students remain on task? (Engagement)
6. How often did students need clarification of the material and activities presented?
7. How often were students able to complete the material without needing clarification?
8. Were answers and discussions appropriate and relevant to activities?
9. Was CORE Language used in the lessons?

During activity students asked a lot of questions and there was confusion about the instructions. Some students focused on publisher content more than anything else about the website/links. During discussions, students were engaged and organized their board clearly and were on-task throughout the activity. There were two students who needed reminders to remain on task.

Activity-> 1 or 2 groups discussed the importance of content, credentials and the layout of the website. Most groups focused in on authorship and publication (government) in their eyes. Because it was government published it was seen as accurate.

1 Group rated the links rather than the indicators and thus was confused about the material.

Day 3: April 26

Discussion Questions:

9. How often did students remain on task? (Engagement)
10. How often did students need clarification of the material and activities presented?
11. How often were students able to complete the material without needing clarification?
12. Were answers and discussions appropriate and relevant to activities?
13. Was CORE Language used in the lessons?

Students were answering questions throughout the direct instruction part of the PowerPoint. They often were sharing ideas and recognized the importance of perspective and how it can be shaped by prior knowledge. There seemed to be very little confusion throughout the material.

Town hall activity students were mostly on-task until the end of the period when some groups were chatting about unrelated things or were not using their devices appropriately. Very few questions about how the town hall will be operated and seemed to understand the process. (This could be because of a similar activity that was done recently).

There was very little time for students to get off topic and the lesson ran quite smoothly. The class was quiet and focused throughout.

As I was walking around the room during town hall prep, most students were actively researching material. One or two students were working on other material and needed some direction to the task.

Wrap-up activity had some questions and was a bit rushed to fit within the period. Some students said they will do it at home.

During socratic section, I often had the same students respond to the general discussion questions. I could try and cold call next time to get different students to answer the questions.

Day 4: April 27  
Locating Information

Discussion Questions:

13. How often did students remain on task? (Engagement)

14. How often did students need clarification of the material and activities presented?
15. How often were students able to complete the material without needing clarification?
16. Were answers and discussions appropriate and relevant to activities?
17. Was CORE Language used in the lessons?

Students were engaged during lesson and lecture. During socratic based discussions students responded with well thought out ideas. The discussion of fake news brought out many good examples and students responded quickly to the answers. One or two students did not participate much at all. A few students had questions about how to use the fact-checking websites.

During town hall, the overall arguments were presented with specific evidence from the articles they found the day before. They referenced the author/site that they found the information. We did not have time to complete the voting as the class was pressed for time by the final speech. Students did not complete the overall rating of the speeches.

Day 5: April 29

4.1 Evaluating Context

### **Many students away**

Discussion Questions:

17. How often did students remain on task? (Engagement)
18. How often did students need clarification of the material and activities presented?
19. How often were students able to complete the material without needing clarification?
20. Were answers and discussions appropriate and relevant to activities?
21. Was CORE Language used in the lessons?

Many students were absent for a variety of in-school-related activities.

This lesson required a bit of retooling as many students were unable to access some of the material on the google slides for the self-study. Thus I had to do the study with them so they could complete everything. There was some confusion from students on where to write the material, so I often had to show them exactly where on the workbook as we went through it.

Students enjoyed looking at the different websites and evaluating their structure. There was a general sense of why these sites are not credible sites due to their structure. When asked to evaluate a news article using CORE, many students defaulted to vague statements like ‘this seems biased’ without explaining why. I prompted them with ‘What part of CORE does that fit into?’ and several then rephrased their analysis: ‘The content is opinion-based, and the source is politically affiliated.’ This shift shows that while students recognize bias, they need support in articulating it using CORE’s structured language.

The small class size did allow me to focus on helping or troubleshooting issues. The majority of the students said they completed all the required material on evaluating the information and used the rest of the period researching for their project.

Day 6: May 3

4.2 Evaluating Source

**Many students away**

Discussion Questions:

21. How often did students remain on task? (Engagement)
22. How often did students need clarification of the material and activities presented?
23. How often were students able to complete the material without needing clarification?
24. Were answers and discussions appropriate and relevant to activities?
25. Was CORE Language used in the lessons?

**Many students are away due to a sports event.**

Some students needed to be prompted to remain on task and follow along on their student workbook. There was confusion about where to write things again and so I had to redirect where they should be which did slow down the lesson.

This lesson seemed to be a little too heavy on direct instruction and could have used a little less material from teacher instruction and more student work. During the direct instruction and Socratic discussions, students understood the importance of the credentials of the author and why it is good to look for them.

The evaluating author teacher-led section did have some students not fully paying attention and may not have understood what was the purpose of doing this in the end which may influence the results on the google form.

The final activity done in groups was only left with 10 minutes of class. Students did manage to get quite a bit of it done but could have used more time to do a more thorough/complete job. I will do the sharing of results in the next period as a take-up depending on the time. Students were reminded notes will be posted to complete the workbook.

Several students were cross-referencing sources more frequently, and one student even remarked However, when students were asked to integrate multiple sources into a single argument, many struggled

I noticed more students using phrases like ‘this author has expertise because...’ or ‘I need to check who funds this website.’ By the end of the lesson, several students were cross-referencing sources and making stronger claims about credibility.”

At least 4 questions about when the intervention is finished.

Day 7: May 4, 11:45-12:45

4.3 Evaluating Context

Discussion Questions:

25. How often did students remain on task? (Engagement)
26. How often did students need clarification of the material and activities presented?
27. How often were students able to complete the material without needing clarification?
28. Were answers and discussions appropriate and relevant to activities?
29. Was CORE Language used in the lessons?

Students were on task throughout the lesson. Students were taking notes as the direct instruction was happening and there was participation during socratic discussions to get students thinking. The lesson itself took longer than expected and so the student activity was a bit rushed at the end and there was not time to do a quick debrief of the activity.

A lot of reminders of where to find the articles that they had to use for the activity.  
At least 6 questions about when the intervention is finished.

Day 8: May 10

4.3 Synthesis 10:40-11:40

Discussion Questions:

29. How often did students remain on task? (Engagement)
30. How often did students need clarification of the material and activities presented?
31. How often were students able to complete the material without needing clarification?
32. Were answers and discussions appropriate and relevant to activities?
33. Was CORE Language used in the lessons?

Students were unprepared for this lesson and so I gave students 10 minutes to finish the table and the readings for the activity.

Lecture students completed notes and were participating. Some students did need prompting to remain on task and avoid chatting during the lesson.

Students were divided into groups for the activity and were given paper to complete their mind maps. A few students were quite confused by exactly what they had to do, so I did need to spend a lot of time helping these students and also making sure that they stayed focused on the task at hand. There are one mind maps that were taken more seriously, and some were quite rushed. All mind maps were collected and will be uploaded to drive.

Students are showing fatigue with the intervention as they are continually asking when it is over and when we move onto the next topic. Approximately half the class brought this up today.

Day 9: May 11  
4.3 Writing 10:40-11:40

Discussion Questions:

33. How often did students remain on task? (Engagement)
34. How often did students need clarification of the material and activities presented?
35. How often were students able to complete the material without needing clarification?
36. Were answers and discussions appropriate and relevant to activities?
37. Was CORE Language used in the lessons?

Writing task went well and students understood how to develop a proper thesis statement. For many of the students they were familiar with this as it has been done before. Some students it was good review.

As students worked on their source analyses, I noticed a pattern: many naturally defaulted to CORE when evaluating digital sources but struggled to apply OPCVL outside of historical documents. One student, when asked about using OPCVL for a news article, said, ‘I don’t really know what to say for ‘values and limitations’—isn’t that just another way of saying if it’s biased?’ In contrast, when students analyzed government websites, some made strong connections between the ‘purpose’ in OPCVL and potential motivations behind the publication

Rest of the time was for the post-test and students took all 35 minutes to write this. There was little questions about the test itself and they seemed to understand the test. Some asked if it would be on the report card, and when I said no, it is possible they took the task less seriously.

## Appendix H-Grading Criteria for Evaluation

*tier-Specific Practices Used By “Better” and “Poorer” Online Evaluators to Justify Their Claims About Website Credibility*

	Definition	All	Percent of “ <b>Better</b> ” Evaluators and Examples	Percent of “ <b>Poorer</b> ” Evaluators and Examples
<b>Content (Primary) Evaluation:</b> Responses referring to the ideas the author presents (i.e., claims, evidence, and reasoning)				
Argumentation	Author’s Argumentation (i.e., use of claims, evidence, reasoning)	14.6	13.2	16.1
“Knowledge Fit”	Content Corroboration (with other resources or with prior knowledge)		it is and it isn’t I would check other site foirst to make sure that the information is all true	it is because it says that on other websites too
Rhetorical Techniques			i think it is reliable because a pro baseball coach wrote it, and he had to do lots of schooling to get to be in that rank. <b>it also uses many specific stats to show the caffeine levels and stuff like that</b>	Yes because he uses a lot of big words and tells <b>a lot of good strong examples</b>
Corroboration (with self / others)				
<b>Source (Secondary) Evaluation:</b> Responses referring to the source (i.e., author, publisher) of the content				
Author	Percent of Students	51.2	88.8	14.1
	Author’s Education		Yes because the author has <b>a degree in health journalism.</b>	Yes, because Julia has a <b>degree in this.</b>
	Author’s Professional Position/Credentials		Yes, the information is reliable because Troy Bedinghaus is a	No because she is <b>not a professional.</b>

		<b>certified optometric physician</b>	
Author's Professional Experience		Yes because he is an eye doctor and <b>he owns his own company</b> just for helping people with eye problems.	
Publisher		Yes the information on this site is reliable <b>because it is the Medill Reports of chicago</b> . Which is kind of like the new york times. It is an official news letter.	Yes, she works for <b>a good website</b>
Rhetorical Techniques		The information on this website is reliable because the author is a dietitian, and she is an expert about the topic. <b>The author didn't get off track when she was writing, and she didn't lose her point of view.</b>	n/a
<b>Peer reviewed / copy edited</b>		"reviewed by other people"	
<b>Context (Tertiary) Evaluation:</b> Responses referring to the context in which the content is situated (e.g., document characteristics)			
	Percent of Students	13.4	14.6
Setting (time, place, culture)	Currency (publication date)	Yes it is reliable because <b>it was copy Wrighted very recently 2010</b> and she has a medical degree and only a few people can Wright on the website (used only with Content or Source evidence)	Yes <b>the date is nere owers</b>
Resource Type and Format	Resource Location as on the Internet	N/A	i am not shere but you can <b>never trust something you</b>

			see ont eh inteenet
Resource Type		not exactly. Because it is <b>a blog and in the web adress it says .com not dot org or dot net ,which would be used for an information website.</b>	no because it is <b>a blog</b>
URL Type		I don't think it is because <b>it is a ".com" website not a ".gov" or a ".org" website.</b> But then again, it also could be a reliable source because the person who wrote it works at an eyecare clinic and she seems like she knows what she is doing	No it is a <b>.com website. only .org and .gov websites are reliable</b>
Third Party Endorsements	Advertisements, Sponsors	because at the bottom of the page it <b>has reliable logos like haverd health pubucations, A.D.A.M, and those are logos I trust</b>	Yes becuase <b>the medical review bord reviewed it</b>
Chart, graphs, tables, etc.	Referring to their presence, not their content		
Grammar			
Appearance/ format/ design		"looks professional"	
General appearance/ impression		"well written"	
Contact information / anonymity		"there was a way to contact the author"	

Note. "Better" evaluators were those students who scored a 1 (out of 1 possible point) on the Evaluate 4 item, which asked, "Is the information at this website reliable? How do you know?" where "reliable" was used as a student-friendly synonym for "credible."

**Table 6**

*Argumentation Practices Used by “Better” and “Poorer” Online Evaluators Within and Across Content, Source, and Context Tiers*

Argumentation n Theme and Definition	Argumentatio n Practice	Definition	Percent of All Evaluator s	Percent of “Better” Evaluators with Example	Percent of “Poorer” Evaluators with Example
<b>Claim</b>	Clear Claim		85.4	95.6	75.1
Providing a claim about the credibility of the online resource	Providing an unambiguous claim (which could include “maybe”)			<b>yes</b> because he is an eye doctor and he owns his own company just for helping people with eye problems	<b>Yes</b> because she is an expert
<b>Evidence</b>	Triangulation Across Tiers		9.3	34.0	4.0
Providing evidence for the credibility or lack of credibility of the online resource	Providing evidence from more than one tier			This information is reliable because the author graduated from the University of California with a degree in Health Journalism in 2007...Also this website was publised in	yes because it was <b>written by a expert not that long ago</b>

			<b>2008</b> , which is not that long ago.	
Triangulation Within Tier	14.1	26.8	2.0	
Providing more than one piece of evidence but the evidence was from a single tier		Yes because he is the <b>president of the Manasota Optometric Society</b> and went to college and <b>got a degree in eyesight.</b>	yes because <b>malanie is an expert and she seems like she knows what she is doing so i think the info is perfect</b>	
Topic Specificity	40.2	77.1	3.4	
Providing specific, accurate details from the website in relation to the topic of the task		Yes, because she is an expert and <b>a dietition.</b> (states what kind of professional the author is)	Well yes I think so because if she is a <b>profession</b> <b>al</b> then she probably knows what she is talking about	
<b>Reasoning</b>	Warrant	15.4	28.8	2.0
Providing reasoning for the credibility or lack of credibility of the online resource	Providing an explanation for the evidence that links the evidence to the claim	Yes, because he is a real eye doctor. <b>So</b> <b>he would under stand vision</b>	No. Because if the author is not a doctor. <b>So if he isn't a doctor then he shouldn't write something that he isn't sure about.</b>	

*Note.* “Better” evaluators were those students who scored a 1 (out of 1 possible point) on the Evaluate 4 item, which asked, “Is the information at this website reliable? How do you know?” where “reliable” was used as a student-friendly