Understanding and Facilitating Historical Argumentation Skills in a Multimedia Learning Environment Among High School Students

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Abstract

The Center for Educational Technologiesâ is developing Foundations of Freedom™, a DVD-based multimedia learning environment (http://www.cet.edu/constitution). Foundations of Freedom™ helps high school students explore the development of the U.S. Constitution and essential constitutional issues throughout history. This study sought to understand students' argumentation skills in the domain of constitutional history. It then identified developmental areas in their argumentation abilities. The results show that to argue successfully, students need to improve at discussing multiple perspectives, obtaining historical evidence, and identifying the limitations of their own decision. Various learning tools in Foundations of Freedom facilitate those weak components.

Argumentation is essential in social science, especially history, for promoting students' critical thinking and decision making. National standards for historical thinking stress the importance of students creating a historical argument of their own (National Center for History in the Schools, 1996). Historical argumentation can be defined in the following way, "a position is supported by offering historical evidence appropriate in a particular situation" (Cerbin, 1988). The essential processes of a historical argument include (a) analyzing and interpreting of issues and events; (b) considering the issues and events from multiple perspectives; (c) obtaining historical evidence to make warranted decision; d) evaluating the documents for the implementation of a decision; and e) alternative courses of action (National Center for History in the Schools, 1996; Toulmin, Rieke, & Janik, 1984; Voss, Blais, Means, Greene, & Ahwesh, 1986). Students need to coordinate representations of several documents, resolve any

inconsistencies among documents, and weigh a information in light of its sources for developing a successful argument in history (Rouet, Britt, Mason, & Perfetti, 1996). The need for developing instructional strategies that improve argumentation skills in history is widely recognized. Many educators have developed instructional activities and teaching methods for improving students' historical argumentation skills (Doppen, 2000; Drake, 2002; Risinger, 1992; Swan, 1994; Tunnell & Ammon, 1996; Wineburg, 1991).

Yet, the results of research indicate that the current education has little impact on students' argumentation skills in history (Cavalli-Sforza, 1991). The reports of the 2001 National Assessment of Education Progress in U.S. history show that a high percentage of students in K-12 did not reach the advanced level achievement, which requires historical argumentation skills (Patric, 2002). Perkins (1985) found that students' ability to construct arguments is generally disappointing and does not significantly improve from high schools to graduate schools. Additionally, high school students have little knowledge of creating historical interpretation, although they may know a lot of history (Doppen, 2000).

Students' shortcomings in the argumentation skills may be attributed to the scarce opportunities for argumentative activities in high school education. Students do not have much experience at facing multiple perspectives. In history classes, students encounter an oversimplified account of history instead of considering various sources of evidence (Tunnell, & Ammon, 1996). In addition, textbooks usually present a single perspective with few conflicting ideas; and a narrow view of history with little variation in the interpretation of our past (Foster, & Rosch, 1997). Secondly, students in schools do not provide various source documents nor do they learn the importance of the documents in the course of developing their arguments (Wineburg, 1991). Lastly, teachers are forced to cover too much material with too little time and consequently focused on content rather than process (Doppen, 2000; O'Neill, 2003). The intention of this study is to create a rich multimedia learning environment in order to overcome the deficiencies in the current history classes. The investigation was conducted as a task analysis to specify the weak components for developing a successful argument among high school students in history. Based on the results of the study, various scaffolding tools in Foundations of Freedom were designed to facilitate those weak components.

Method

Participants

The participants in this study were 28 ninth-grade history students. For conducting think-aloud protocol, three additional subjects were selected: a ninth-grader, a junior college student, and an expert in history. There were 17 females and 14 males. All were Caucasian.

Instrument

The Center for Educational Technologies team constructed an open-ended essay to understand students' argumentation skills on historical and constitutional issues (Cerbin, 1988). The open-ended question was, ***"Defenders of the War Powers Resolution praise it as consistent with our system of government based on separated powers. In contrast, the resolution's opponents maintain that it undermines that principle. What is your position on this issue?"*** In this task students addressed one theme, separation of power in the U.S. Constitution. They had to compose in a historical context their own claim to the constitutional issue of the War Powers Resolution.

The team provided students with historical reading, including the U.S. Constitution, the Gulf of Tonkin Resolution, the Senate debate record on Tonkin, an article on the invasion of Cambodia, President Nixon's speech on Cambodia, and the War Powers Resolution.

Scoring Systems

Student papers were scored according to the criteria from a Toulminian argumentation theory and from historical argumentation (Toulmin, Rieke, & Janik, 1984). A Toulminian argumentation theory defines the important elements in an argument: a claim, grounds, a warrant, a backing, a qualifier, a rebuttal (Toulmin, Rieke, & Janik, 1984). The rubric dimensions contain five features: a claim, multiple perspectives, evidence, the limitations of one's own decision, and an opposing position. Here's what the criteria focused on for each of the five features:

- Claim—how well does the argument state a clear position relating to the essay's theme.

- Multiple perspectives¾ how many perspectives relevant to the topic does the argument state and how well are the perspectives integrated to support the claim.
- Evidence¾ how relevant is the historical evidence to support the claim and how well is the evidence integrated within the argument.
- Limitations of own decision¾ how well are the limitations or drawbacks of the student's decision identified and how well does the student defend the decision in the face of the limitations.
- Opposing position¾ how effective is the student in evaluating and comparing the weaknesses and strengths of the counter position with his or her own decision.

The criteria provided specific descriptive information for students' argumentation processes. The scores ranged from 0 (low) to 4 (high) for a claim and evidence. The scores ranged from 0 (low) to 3 (high) for multiple perspectives, the limitations of the decision, and an opposing position. Two raters evaluated the compositions independently. The average of the two scores was used in the analysis. Overall interrater reliabilities, determined using Cronbach Alpha, was .92.

Procedures

Students first were given reading a day before as a homework assignment. They were allowed to spend as much time as necessary to read the documents. The students then received the open-ended essay in class. Additionally, investigators tape-recorded the responses of the three aforementioned "think-aloud" subjects. They were asked to think aloud while they tackled the essay. After finishing, they were interviewed individually to verify how they approached the question and what they thought the task was about. All participants were allowed to use the reading documents as references when answering the question. They also were given as much time as necessary to finish. Most were done within 45 minutes.

Data Analysis and Results

The data came from written and oral argumentation tasks. Student responses were scored according to the rubric systems and analyzed using descriptive statistics and think-aloud protocol methods. Argumentation skills were investigated by examining whether students formulated a claim, discussed multiple perspectives, provided evidence, stated limitations of their own decision, and evaluated opposing positions in composing an historical argument. Student responses were rated for the quality of their claim, the number of perspectives, the evidence, the statement of limitation, and the discussion of opposing positions using descriptive statistics and think-aloud protocol methods. The total scores were correlated to the five components to understand a pattern of students' arguments. Table 1 shows means, standard deviations, intercorrelations, and interrater reliabilities for each of the five components of students' arguments.

Table 1. Means, Standard Deviation, Interrater Reliabilities, and Intercorrelations of the Variables with the Total Scores

Trait	Mean	SD	Correlations	Interrater Reliabilities
Formulates Claim	2.45 (61%)	1.00	.64**	.86
Discusses Multiple Perspectives	1.5 (50%)	.54	.25	.91
Obtains Evidence	.48 (12%)	.82	.15	.91
Identifies Limitations of Own Decision	.50 (17%)	1.04	.50*	.98
Evaluates Opposing Position	1.8 (60%)	1.03	.70**	.91

Note. ( ). Standardized proportion of the means. **. $p < .01$. *. $p < .05$.

According to the results, the students scored 61 percent (M = 2.5 out of 4) in formulating the claim, 50 percent (M = 1.5 out of 3) in discussing multiple perspectives, and 60 percent (M = 1.8 out of 3) in evaluating the opposing position. Students scored less than 20 percent in obtaining evidence (M = 0 .48 out of 4) and identifying the limitations of their decision (M = 0.5 out of 3).

The intercorrelations (Pearson Product Moment Correlation) of three features¾ formulating a claim (r = .64), identifying the limitations of their decision (r = .50), and

evaluating the opposing position (r = .70)¾ were statistically significantly correlated with the total scores. However, there were not statistically significant relations in discussing the multiple perspectives and obtaining the evidence.

Additionally, the differences of argumentation processes were analyzed by comparing those of an expert, a college student, and a high school student. In the analysis of think-aloud protocol, the responses of the subjects were categorized into the five components by examining (a) which components the subjects presented and (b) how the subjects represented the components in their arguments. Then each component was compared individually among the three subjects to understand the differences in the argumentation patterns among an expert, an intermediate, and a novice in history. Although the analysis is preliminary, several noteworthy findings arose in the analysis of think-aloud protocol. The expert concentrated on finding relevant evidence and considering all possible perspectives before reaching a conclusion. In contrast, the ninth-grader decided a position immediately after reading the background information and the question. This person tended to focus on brief descriptions in the background information rather than on available historical evidence to develop an argument.

Discussion and Implications

The study showed that the argumentation skills of students in the target high school can be considered poor in history. The results indicated that students have moderate skills in formulating a claim and evaluating the opposing position for developing a historical argument. The results further demonstrated that the weaknesses are in discussing multiple perspectives, obtaining historical evidence, and identifying the limitations of one's own decision.

In the criteria of discussing multiple perspectives, the mean of 1.5 shows that students focused on only one or two out of three possible perspectives related to the topic. Moreover, the results of correlation highlighted that the constructs of discussing multiple perspectives did not discriminate between good and poor students. It is speculated that most of students are able to identify directly presented perspectives but not deeper-level perspectives in a context. On the basis of the results, students are needed to encourage for searching all possible perspectives in a context to develop a successful argument.

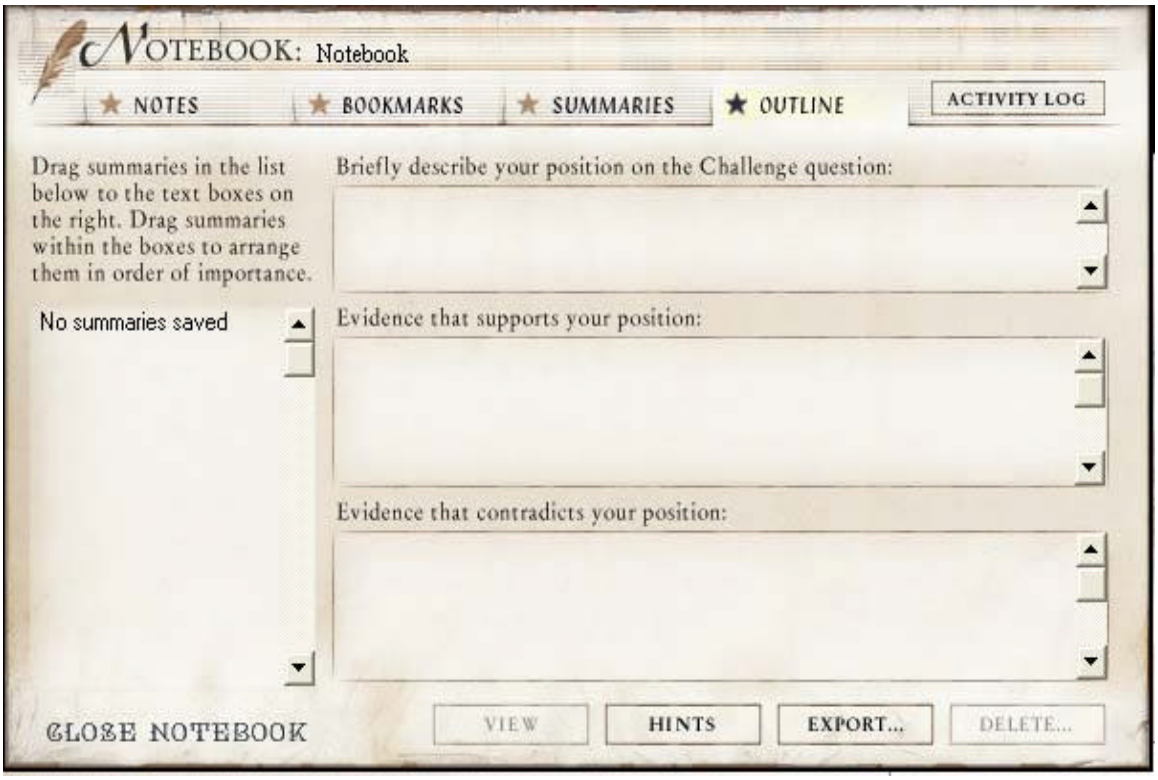
In the case of obtaining evidence, the correlation of the obtaining evidence with the total scores did not discriminate between good and poor students. Additionally, the mean proportions of the scores were less than 15 %. The results indicate that obtaining evidence from sources is the most difficult component in the development of an argument for high school students. The results are consistent with previous research studies (Crammond, 1998; Wineburg, 1991). Designers must put considerable effort toward scaffolding students to collect evidence from a variety of sources.

The students who developed a successful argument were proficient in identifying the limitation of their own decision. However, most students failed to identify the limitations of their own decision based on the students' low mean scores. It is necessary to support students for identifying the limitation of own decision in order to support the development of a successful argument.

Finally, the results of think-aloud protocol demonstrated that the expert spent an enormous amount of time on planning, finding possible perspectives, and selecting relevant evidence. Then they formulated a claim and evaluated the opposing position. In contrast, the high school student focused mainly on formulating claims and evaluating the opposing position.

The results suggest that instructional designers should create a learning tool to scaffold students' weak components: discussing multiple perspectives, obtaining relevant historical evidence, and stating the limitations of their decision. The development team for Foundations of Freedom created learning tools to scaffold students' weak components. The Archive—a search engine—was designed to encourage students to collect evidence from multiple perspectives (See http://www.cet.edu/constitution/archive.html). The Bookmarks and Summaries were designed to facilitate students to obtain relevant evidence from available documents in the Archive (See http://www.cet.edu/constitution/notebook.html). Finally, the Outline tool was designed for scaffolding students to state the limitations of their decision (See Figure 1). The main principle was encouraging students to collect evidence for all possible claims (positions) from the Bookmarks and Summaries. The representation Outline tool provides students opportunities to consider the limitation of their decision because they are able to see the evidence for opposite decisions.

Figure 1. Foundation of Freedom: Outline



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