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Improving Student Ability in Interpreting Visual Sources through Action Research

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Abstract

This paper reports the experience of a History Professional Learning Team (PLT) from St. Andrew's Secondary School in 2017 in developing literary strategies to improve student ability to read and interpret pictorial sources. An action research strategy was used with 150 students for this purpose. Students were explicitly taught the "Triangle Method" of source analysis, as well as specific persuasive techniques used in political cartoons to help them make sense of visual sources. The team found that the strategy of focusing on students' prior knowledge and allowing them to engage in think aloud protocols had resulted in significant improvements in students' ability to analyze pictorial sources.

Introduction

While the History PLT members at St. Andrew's Secondary School had varying degrees of experience teaching upper secondary history, they shared a common concern in managing students' difficulty with interpreting visual sources in history. Pictorial sources like political cartoons and posters convey various messages and offer diverse perspectives. They also offer both popular beliefs and discerning views shared by different sections of a society on particular historical events. However, the messages in political cartoons tend to be abstract; interpreting these sources would involve deep understanding of rhetorical devices and persuasive techniques that are seldom (explicitly) taught in history classrooms. (Schoelfeldt, 2000; Gallavan, Webster & Dean, 2012). Interpreting historical sources like political cartoons, then, would require a deeper understanding of historical context as they may contain hidden messages that are not easily deciphered or uncovered. As such, some writers have suggested that perhaps more intelligent or high performing students may benefit from analyzing such cartoons as they are more adept at critical thinking (Haas, 2012). Yet, pictorial sources are a staple in the compulsory Source Based Question (SBQ) component of the national exams, which assesses students' ability to understand, analyze and evaluate a range of historical source materials as part of historical inquiry (MOE, 2017). Hence, regardless of their ability levels, history students in Singapore must be equipped with the skills and the ability to interpret all manner of historical sources, including political cartoons and other similar pictorial sources. This undertaking has become quite a challenge for both history students and history teachers in Singapore.

In the course of our discussions, the History PLT identified three issues that seemed to impede students' understanding of pictorial sources:

- First, students face difficulties in "getting" the overall message of pictorial sources;

- Second, many students are unable to provide relevant evidence to support their interpretation of the source (i.e. the "message" of the source); and
- Third, students are more likely to describe and make observations without providing historical contextualization as the basis upon which the analysis or interpretation of the sources were made.

Various strategies were undertaken by teachers in the school to address student difficulties when interpreting political cartoons and other pictorial sources but these achieved little success. Some of the strategies discussed included the initiative to re-teach the SBQ format and structure answers for students, and another involved exposing students to as many pictorial sources as possible and engage them in standard SBQ-based "drill and practice" approaches to analyze sources. Despite these approaches, however, we found that our students still encountered difficulties in interpreting pictorial sources. In 2017, the PLT adopted the issue as an area for action research.

Survey of literature

From our reading of the literature, we noted that pictorial sources are valuable tools to teach soft skills like critical thinking, and that the value of such an approach goes beyond simply doing well for the exams.

Morrison (1992), for example, emphasized the value of analyzing political cartoons and other pictorial sources and maintained that "political cartoons teach us how to read" and "there are arguably few art forms that are as valuable to the educator in terms of facilitating critical thinking, interpretation, and analysis in such an entertaining way as political cartoons." For her, "political cartoonists are in equal parts artist, journalist, and satirist."

Yet, interpreting pictorial sources can be a huge challenge for many students. Students, particularly at the younger grades, tended to find political cartoons difficult to understand (Lukus, 1999). Studies have shown that many secondary school and college youths from the 1930s through to the early 1990s continue to have difficulty understanding editorial cartoons (Heitzmann, 1998). Some even questioned the ability of school students and even adults to comprehend the medium. Such problems seemed long-standing as studies in the 1960s had also reported that only 15% of adults were able to understand the cartoonists' message. (Brinkman, 1968; Carl, 1968).

What may be the cause for this? Werner (2004) suggested that one of the reasons for students' difficulty with interpreting pictorial sources lay with educators who do not spend sufficient time explicitly teaching the skills needed to interpret pictorial sources. He felt that many educators often assumed that interpreting pictorial sources was an innate ability that students possessed. For Werner, most writers of history and social studies texts tended to use cartoons that focus on content rather than on how such pictorial sources were used to enable readers to examine implicit assumptions or how they can be used to develop interpretations.

Werner's views seemed to correlate the assumptions behind certain strategies the PLT had employed before 2017. We recognized that instead of helping students interpret pictorial sources, focus was instead placed on providing students with specific structures to answer source-based question. The main assumption was that mastery of a proper writing structure for

the different kinds of SBQ question types would enable students to interpret pictorial SBQs effectively. This often led to further interventions which dealt primarily with writing structures rather than historical analysis and interpretation.

What, then, is the way forward? Some scholars provided alternative approaches that the PLT team found we could adapt. For example, Burack (2000) proposed that students have been taught to view political cartoons and other pictorial sources as mediums that employ complex visual strategies that make a point quickly in a confined space. He argued that "mastering the language of cartoons" may need to take precedence before they can benefit from "these fascinating sources of insight" to interpret the past. He also recommended developing the student's ability to decode the various persuasive techniques to help students understand the underlying meaning the cartoonist is trying to make. Nokes (2013) held similar views. He believed that "through the process of identifying and breaking the code as well as constructing meanings with the code in relation to the context of the cartoon", students can then develop the literacy to understand the persuasive techniques employed by the cartoonist to interpret cartoons and other visual sources.

Wineburg, Martin and Monte-Sano (2013) also developed a three–part sequence to help middle school and high school students develop a proper schema for decoding cartoons. For them, decoding visual evidence such as cartoons and art begins by having students consider what they see and staying close to the details of the image. Next, they should develop an interpretation of what is seen by looking at representations, symbolisms and issues from the historical context. Following these two stages, students would then be expected to speculate on the ways their historical interpretation addressed the cartoonists' argument or main message.

In the PLT deliberations, Burack's "persuasive techniques" was considered appropriate in helping students "decode" pictorial sources and help make their interpretation of pictorial sources more effective. A website at Eastern Illinois University (EIU) was found useful in highlighting the five common persuasive techniques that could be used to help teachers teach interpreting pictorial sources explicitly to the students. These focused on the explicit teaching of: *exaggeration, labelling, symbolism, analogy*, and *irony*, as literary devices that are commonly found in political cartoons. The EIU model for instruction was modified so as to make it more age-appropriate, and suited for secondary school students' level of understanding. Four common persuasive techniques were adopted for instructional attention: *Symbols*, *Caricatures* (Exaggeration), *Size* (Exaggeration) and *Irony*. *Labelling* was omitted because this was not explicitly represented in all cartoons. *Analogy* was also omitted in order to remove the complex cognitive processing which could make the content unsuited for introductory lessons on the topic.

Purpose of study

Action research (AR) was selected by the PLT as the most suitable approach to assess the effectiveness of the classroom intervention. This is because this strategy can simultaneously assist in practical problem-solving and expand practitioner knowledge. It can also be used to help understand the changes or processes in class instructional systems through cyclical structures of implementation and teacher reflection.

Based on the literature review and

discussions among the PLT, the questions that the team sought to answer through AR were as follows:

1) Are students able to identify the main message of the source more effectively after intervention?
2) Are students able to provide better supporting evidence for their source analysis after intervention?

Methodology

The study involved 150 students from six classes. There were three classes of Secondary 3 Normal Academic students totaling 57 students and 3 classes of Secondary 3 Express students totaling 93 students. Each teacher involved took one Secondary 3 Normal Academic class and one Secondary 3 Express class.

In the initial stage of the AR, students undertook a pre-test pictorial SBQ assessment to gauge their competency in interpreting pictorial sources. The SBQ and the Levels of Response Mark Scheme (LORMS) were designed by teachers in the PLT and were used for both the Secondary 3 Express and Normal Academic students. This was to reduce the variability of the project. In order to have a more accurate comparison, the PLT also ensured that the same kind of questions were used for the same unit content.

For the post-test, students answered a pictorial based question which was similar to the pre-test, with the objective of determining whether students are able to improve their ability to interpret pictorial sources and to identify the main message of the source with supporting historical evidence. Between the pre-test and the post-test, teachers co-designed and taught their students strategies to make inferences from pictorial sources. This was done by explicitly teaching persuasive techniques found in sources and by modelling the "Triangle Method" to address issues that student faced when developing their historical interpretation.

Throughout 2017, the PLT discussions progressed through the following phases.

Phases of Project

Phase One	Identification of Problems Literature Review
Phase Two	Planning, Brainstorming Lesson Ideas Lesson Planning (see Appendix 1)
Phase Three	Conduct of Pre-Test with classes
Phase Four	Implementation of Lesson Plan Teaching of Persuasive Techniques Teaching of "Triangle Method" Modelling with students using a pictorial source.
Phase Five	Conduct of Post Test
Phase Six	Data Collection Data Analysis

Teaching persuasive techniques and the Triangle Method

The PLT team adopted a three-stage process to teach persuasive techniques, as outlined in Figure 1 below:

Figure 1. Teaching Persuasive Techniques

Stage 1: Teaching of Persuasive Techniques	a. Hook activity Use of a hook activity to activate students' prior knowledge on persuasive techniques b. Introduction to the Triangle Method
Stage 2: Teaching of Triangle Method	c. Explicit teaching of the Triangle Method in historical topic (i) Dividing pictures into 3 parts (ii) Noting all the details of the source in 3 parts (iii) Deciding which details in the source are most important (iv) Drawing a triangle and putting the 3 important details for analysis (v) Based on the details of the triangle, develop a historical interpretation/message for the source (vi) Provide evidence to support answers using information from stage (ii) and (iii)
Stage 3: Modeling with students using a pictorial source and application to new political cartoon/ pictorial source	Use of visual sources from the topic on Stalin's Russia to model an answer for the students. Post Test worksheet given for students to apply what they have learned in the lesson.

Stage 1 comprised a hook activity to activate students' prior knowledge on persuasive techniques. Symbols commonly found in students' real life experiences were used to connect their daily experiences with what they were learning in class. This created an authentic learning experience and made the lesson more relevant and meaningful for them. Students were also introduced to the elements of the Triangle Method.

Stage 2 sought to teach persuasive techniques to the students by using two additional scaffolds to help student use persuasive techniques more effectively to handle pictorial sources.

First, the students needed to be taught explicit skills on how to decode different parts of the pictures and do their observations of the pictures in a sequential and methodical manner.

(i) Divide pictures into 3 parts
(ii) Note all the details of the source in 3 parts
(iii) Decide which details in the source are most important
(iv) Draw a triangle and put in 3 important details for analysis

Second, after the students have successfully decoded the picture, they were taught explicitly how to put the picture back together again in a coherent

way to develop a historical interpretation to get the overall message. The two scaffolds were taught in tandem with persuasive techniques found in the cartoons.

(v) Based on the details of the triangle, develop a historical interpretation / message for the source
(vi) Provide evidence to support answers from stage (ii) and (iii)

In *Stage 3*, teachers modelled with students how this could be done using a pictorial source. Students will then apply this methodology onto a new political cartoon or a pictorial source.

Six Steps Criteria of Success, the Triangle Method and Model-Think-Alouds

Criteria of success

The PLT designed a six-step criteria for success to help students evaluate their source in a systematic way and to help them pick out important details in the pictorial sources and interpret them effectively using persuasive techniques.

This six-step criteria was used as a scaffold to help students decode different parts of the picture.

Triangle Method

The Triangle Method was another scaffold developed to help students prioritize their observations in terms of their level of importance to make a defensible historical interpretation. The students would then use several of the important aspects of the pictorial source to make a historical interpretation or message with due consideration of the historical context. This scaffold was intended to help students place the picture "back together" in a coherent manner and to derive an interpretation based on historical evidence.

Model-Think-Aloud

In order to reinforce student learning, a model-think-aloud approach was adopted to allow teachers to demonstrate explicitly how persuasive techniques may be used. This was done by going through an actual pictorial source with students. Using a step-by-step approach, the teachers demonstrated a way of evaluating the source using persuasive techniques, using the scaffolds of the 2 sub-skills ('breaking' the picture and the 'triangle' method).

Analysis of data and findings

Table 1 below provides a summary of the student pre-test and post-test scores on their ability to deal with pictorial sources:

Table 1: Summary of Results (n=93)

Classes	Pre-test mean	Pre-Test Standard Deviation	Post-test mean	Post-Test Standard Deviation	p-value	Data Analysis
A (n=15)	3.13	0.74	3.87	0.92	0.0228	Statistically significant
B (n=18)	2.83	1.54	4.67	1.53	0.0004	Extremely statistically significant
C (n=24)	3.17	1.01	3.25	1.33	0.7140	Not statistically significant
D (n=38)	3.87	1.14	4.58	1.03	0.0066	Very statistically significant
E (n=33	3.39	0.83	4.61	1.12	0.0001	Extremely statistically
F (n-22)	3.85	0.21	3.73	0.88	0.2607	Not statistically significant
Total (n=150)	3.46	1.05	4.17	1.24	0.0001	Extremely statistically significant
Express level classes	3.72	0.92	4.37	1.08	0.0001	Extremely statistically significant.
Normal level classes	3.05	1.13	3.86	1.41	0.0002	Extremely statistically significant.

For both Secondary 3 Normal Academic and Secondary 3 Express classes, data analysis showed that the intervention was "extremely significant" and hence effective in (a) getting students to infer the main message of the source and (b) providing supporting evidence for their source analysis.

There were some variations between Classes C and F but this could perhaps have been caused by limitations in the AR design.

Overall, when the data was compiled for the three Secondary 3 Normal Academic classes, the analysis showed that the intervention was "significant" and hence effective. For the 3 Secondary Express classes the data analysis also showed that the intervention was "significant" and hence effective.

Discussion

For the PLT, the AR project demonstrated that pictorial sources (mainly posters and political cartoons) may be shown to use representations, symbolisms, caricatures and irony to convey various messages that reflect the historical context of the time – aspects that students may be

unaccustomed to. Such messages in some of these pictorial sources can be abstract and obscure. Even if students may be exposed to such genre, they may lack the literacy skills to understand them. Clearly, such sources use persuasive devices which are encased in paradox, irony and analogy which make it difficult for students to understand (Schoenfeldt, 2000).

However, we found that most students in our AR were able to unfold the layers of meaning conveyed in each image because they were given scaffolds that allowed them to tap into their prior knowledge, especially on ways persuasive techniques are used in the media and in their daily lives. This served as a backdrop to build on their existing knowledge about such literacies. It was also observed that "hook" activities that allowed students to discuss advertisements they encountered in their daily lives aided student learning. This was especially if they were followed by explicit instruction on identifying and annotating symbols.

The results of the AR also pointed to the need to teach students a method of systematically viewing and examining pictorial sources that guided them in dissecting the pictures into parts and picking out its three main details for analysis. Such an approach enabled students to be familiar with the use of different kinds of symbols, irony and caricatures used during the period. Such explicit approaches are an important pre-requisite to enable students to analyze sources and to derive the message of the sources. Explicitly modelling the thinking behind pictorial source interpretation also reinforced students' ability to identify different caricatures of famous personalities and to recognize various persuasive devices found in the sources.

In some classes, explicitly comparing the similarities and differences in the kinds of persuasive devices used across different topics and modelling the thinking behind "historical contextualization" also helped students to develop their confidence in being able to interpret sources using evidence-supported answers.

The PLT members also felt that providing students with opportunities to learn by creating platforms to articulate and apply their new knowledge through purposeful and methodical ways of decoding pictorial sources was important for student learning. The AR approach helped demonstrate the effectiveness of the PLT intervention and allowed the teachers to teach in ways they had never done before. This was done by getting PLT members to rethink their own practice through a reading of key literature, and using student evidence and data to co-design new classroom instruction.

Limitations

While the pre-test and post-test were the same in terms of question type and syllabus content, there were minor variations in their format which may have accounted for the variance in results. For example, the pre-test had excluded the success criteria but post-tests were carried out with the embedded success criteria made explicit in their answer sheet. For future use, the PLT would consider removing the success criteria from the post-test to limit variability in the results. As much as possible the pre-test and post-test should have the exact same format.

Another limitation was the time gap between the pre-test and post-test. As teachers were teaching at a different pace, several classes conducted their post-tests when the students were already studying other topics in the syllabus. This may also have affected the variations in the post-test

results because of the misalignment in terms of the learning pace of the classes involved.

Upon reflection, the PLT members also realized that there were some variation with how persuasive techniques were taught to students. It would have been beneficial for the team leader to model the lesson plan for the rest of the team to minimize the variation in the approaches used. This would have ensured that team members taught the lesson in the same manner, thus reducing result variability particularly in the case of Class C and F where the teacher had carried out the lesson in a manner that was different from the lesson plan. Below are the individual reflections of the PLT members involved in the AR project.

Reflections

Chew Ee

The project helped me understand the importance of doing a proper literature review and giving time to troubleshoot students' problems. Most of the time in PLT projects, teachers are focused on coming up with interventions and implementing them in the classroom. However, without giving time to read the literature review to explore students' problems properly, interventions may be based on misconceptions and wrong assumptions. (This was the case with our department's previous interventions with pictorial sources.) A review of the relevant literature helped us to check if the larger educational community faced similar problems. It also helped us by identifying possible reasons and problems students faced, and potential solutions suggested and tried out by experts. Through the literature review we were able to assess that we have been providing the wrong kind of intervention that did not help students with interpreting pictorial sources. We were also able to provide a viable strategy to address students' problems.

Marek Otreba

Working with my team in the co-construction of the lesson, activities and assessments was a great experience. I learned a lot on how to use data more effectively. Often as teachers we have a hunch or gut feel that something works or doesn't work in terms of teaching and learning. But carrying out this research-based project with my team and trying to make sure our data was relatively rigorous made me reflect more on the strategies we used and the impacts it had. For instance, I had a gut feel that the students were providing better inferences and more detailed evidence after our intervention on using persuasive technique. To me their answers seemed more thoughtful and more students seemed to be able to get the main message of the source. But learning how to carry out a sound data analysis added credibility and confidence that this strategy was indeed effective. I consider this project a first step of many in using data effectively to improve teaching and learning. In the future, if I have a strategy to improve teaching and learning (i.e. using a performance-based assessment to assess student understanding of a topic) I will employ with my team a similar methodology in my research. Innovative ideas that are backed by credible data are more likely to be sustainable.

Gwee Yi Fen

Previously, I always felt frustrated teaching students pictorial sources as I had problems scaffolding students' thought processes to derive the overall messages of such sources. It was insightful to draw on advertising techniques to teach students techniques used in pictorial sources. The

possibility of tapping into students' prior knowledge of common symbols and caricatures before teaching them the aforementioned was also very helpful in carrying out the intervention lesson. Interestingly, I realized from this project that students can be taught a method of systematically viewing and examining sources by dissecting the pictures into parts and picking out its three main important details. After carrying out the intervention lesson, I feel confident in carrying out future lessons teaching students how to approach pictorial sources in a purposeful way, such that they do not resort to intuition or instinct to derive the overall messages of pictorial sources. Taking part in this project was particularly insightful as I learnt that the effectiveness of teaching pedagogies can be quantified and this provides me with an objective way of ascertaining teaching practices that should be improved or continued.

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