Colonial Russia in California history: A multimedia tutorial

William Elmer Martisius

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COLONIAL RUSSIA IN CALIFORNIA HISTORY

A MULTIMEDIA TUTORIAL

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education: Instructional Technology

by
William Elmer Martisius
June 1998
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Approved by:

Rowena Santiago, First Reader

Sylvestor Robertson, Second Reader
ABSTRACT

Colonial Russia in California History is an interactive, self-paced, computer-based, multimedia tutorial/database designed to enrich the study of California's past. Its intent is to expound on a little known topic and render significance to the Russian contribution to California's formidable multicultural heritage.

Therefore, this project endeavors to provide digitized materials to expound on Russian's failed colonial venture in California, their influence during the 18th and 19th centuries, and their relations with Native Americans, Spanish, and Mexican peoples in California history. By doing so, it is hoped that the project will be useful as an ancillary resource, reinforcing California's rich multicultural role in the formative years of its history.

In addition, the multimedia tutorial was designed to address the multiple intelligences of fourth grade learners and guide their quest for knowledge with authentic, self-paced, materials that enhance the classroom curriculum.
ACKNOWLEDGEMENTS

Looking back at the beginning of this program, I can scarcely believe I've come this far. All the classes and course work seems like a fading memory. But the people that I've met and learned from along the way, I can never forget. To my colleagues, I extend a hearty thanks. In particular, I salute Michael Fergon who's been a lot of help and a good buddy. I won't forget those commutes, fast foods, and good conversation along the way. Also, Greg Jackmond who's been a real fountain of techno-knowledge deserves a lot of credit. All the best to you Greg. This page of appreciation would not be complete without thanking Lani Ray for her friendship throughout the program and her eleventh hour support and advice. To my wife and family, I say thanks for putting up with this mid-life crisis. I should have done it 25 years ago. I must have been very hard to live with. I want to thank my son Lukas, who also was extremely useful in getting me up and running with computing skills. Lukas, you always seem to be a step ahead of your pappy on the family computer. Please stay that way.

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CHAPTER ONE
INTRODUCTION

Whose History Is It?

It is refreshing to be able to view history from different perspectives. Understanding is increased even if the sources, primary or secondary, are sketchy and inconclusive. Up until recently, teachers relied on textbooks for the authoritative final word regarding the various issues of history. But history is more than just textbooks and good educators have known this all along. History is less definable than math or science. Even the English language has its conventions for grammar and speech. But historical interpretation seems to change from generation to generation. "History is as much art as it is science. Less like calculus and more like beauty, it springs from the eye of the beholder" (Harp, 1996 p.34).

With this in mind it is, indeed, sobering to inquire into the depositories of past generations. As with all discussions of the past, recent or ancient, one inevitably must ask the question: Whose history is it, and how are we to interpret it? One would like to think that textbooks, being published and taught in the schools, are objective and free from bias but this is not always true. Everyone has a bias, including historians. Knowing this, a reasonable approach to interpreting history should include as many plausible
views as possible. Harper (1996) cites Brian Nelligan, a veteran social studies and history teacher from Essex Junction, Vt. who says, “We should want to teach as many points of view as possible because we want students to generate their own meaning and know how to work with others to generate further meaning” (Harp, 1996, p.34).

Today, standards for content in the field of history are being called into question as more historical realia becomes assessable. Resources are more available and the Internet is providing great volumes of data at lightning speed. But this wealth of primary source materials create new challenges. “They invite teachers and students to confront new kinds of materials, new perspectives on historical events, and a new need for historical context.” (Tally, 1996, p.40).

**Statement of the Problem**

At the close of the 20th-century, access to information is growing at a rapid pace. Vast amount of data is available at virtually any internet terminal. But gathering and organizing information is one thing; interpreting vast amounts of data remains the greater problem, and converting data to fresh understanding is clearly the end goal. It is this process that is the problem and the challenge. “It is a long journey from data to wisdom. Along the way
students must convert data to information, information to knowledge, and knowledge to understanding, which may ultimately lead to wisdom." (Valenza, 1996, p.52).

Seeking the truth about the past can be altogether unruly at times and the process requires great patience and collaboration. In addition, to make history come to life, it requires a multidisciplinary and collaborative effort. Just as the paleontologist works with geologists, museum curators, taxidermists, and artists to cause dry bones from riverbeds to come to life, so to, does an historian require the services of writers, directors, actors, film-makers, software publishers, and talented teachers to bring to life events of long ago.

Today with the ever increasing use of software presentation tools like Digital Chisel and HyperStudio, teachers and students can construct their own vita of history. Multimedia resources are becoming reasonably priced so that reports and findings can be presented in an interesting and timely manner. Primary source documents in history are being organized for internet access; however, this process remains a tedious and time consuming endeavor. Visuals and graphics are available on CDs and the internet, but again, they are generic in nature. Though the current offerings of commercially produced historical software tends toward general content, a growing demand is developing for regional and
multiculturally inclusive instructional software. A review of the recent education media catalogues reveal that a number of new titles are supporting this trend.

An area that lends itself as good content material for a multimedia history project is the Russian involvement in early California history. This is part of the curriculum framework for teaching California Social Studies and enhances multicultural understanding. However, instructional materials on this subject are very few, if not nonexistent.

A review of the current 4th grade California social studies textbooks will show that early California history includes the Indians, Spanish, Mexicans, and Americans, but little is mentioned about Russia's place during this period. Furthermore, several previous issues of state-adopted textbooks seem to perpetuate this limited interpretation of Russian influence and involvement in early California history.

Project Overview

The purpose of this project is to design and construct an interactive, hyperlinked multimedia tutorial/presentation with lesson objectives and questions about the Russian contribution to early California History. The content of the project encompasses the Russian involvement in California
history and will also include an interactive view of the Americans, Spaniards, Mexicans, Aleuts from Alaska, and the Kayasha Pomo tribe from Northern California.

The project will be used as an ancillary resource and supplemental reference to the study of California history. In that capacity, it is hoped that it will also stimulate further research by students, so that they might begin their own learning quest, frustrations and all, toward a lifestyle of inquiry.

In addition, due to California's geographic location bordering the Pacific Ocean, the following maps will be integrated into the project: Pacific Rim, Alaska, North America, San Francisco Bay Area, Russian River region with Fort Ross.

Topics to be integrated would include:
- Vitus Bering, Swedish explorer employed by Russia
- Russian colonies in Alaska
- The fur trade
- Fort Ross (Russian colony 80 miles north of San Francisco
- Relations with Spanish, and Mexican authorities
- Relations with indigenous peoples (Kashaya Pomo)
- Trade relations with California missions
- The Monroe Doctrine
Also, an extensive timeline database will be included for cross reference and continuity purposes.

The final project will incorporate multimedia features such as paintings, sketches, photos, graphics, sound effects, songs, and video clips with pop-up and scrollable texts objects. The project will be available on CD-ROM.
CHAPTER TWO
REVIEW OF THE LITERATURE

Overview of Russian Interests
in California History

When talking about the Russian impact on early California history a number of paradoxical questions come to mind. Why did they come so far? What were they looking for? And what caused them to leave?

For several centuries the Russians had been expanding eastward. During the time of Peter the Great they had pushed all the way past the northern boarder of China to the Pacific Ocean. The only region that remained unexplored was north and to the east. Vitus Bering was employed by the Tsar to build ships and explore this unknown region. Bering died in his efforts but paved the way for further discovery of Alaska. In the process, vast herds of fur bearing animals were discovered and began to be hunted.

Though many furs were sent back to Russia, a larger market was closer by in China. As the herds became depleted, the hunters began island hopping toward Alaska. These hunters came into contact with the Aleuts which were superior hunters, having lived in these regions for centuries. The Russians, however, with advanced technology, easily subjugated the Aleuts and made them unwilling surfs to Imperial Russia.
It was not long before the Russians looked south to Spanish waters and California. Their need for food and furs drove them south, all the way to Baja California. In the process, the Russians established a fort north of San Francisco called Ross where they stayed from 1812 to 1841. That was to be their farthest colonial extent in America. There they hunted and traded up and down the coast. Due to careless over hunting, the fur-bearing mammals were almost driven to extinction and the colony could not support itself either through trade or farming. In addition, foreign competition drove the Russians out of business.

They eventually sold Ross Colony to none other than Captain John Sutter of Sacramento and returned back to Alaska only to sell all of Alaska to the United States in 1867. Thus the Russian venture in America had ended, but their presence during the seventeenth and eighteenth centuries had a profound effect on the foreign policies of Spain, Mexico, and the United States.

California History-Social Science Framework

The 1988 History-Social Studies Framework for the California Department of Education [CDE] encompasses kindergarten through grade twelve. Before graduating from high school the children of California will have been exposed to many disciplines within this framework
including; history, geography, economics, psychology, anthropology, political science, sociology, and the humanities. The framework mandates that our young people understand our history, institutions, ideas, values, economy, and relations with other countries. California students also, need to know about other cultures, so they can participate in an increasingly global environment. "Specifically, we want our students to learn about the cultures, societies, and economic systems that prevail in other parts of the world and to recognize the political and cultural barriers that divide people as well as the common human qualities that unite them." (History-Social Science Framework, 1988, p. 3).

In addition to the many distinguishing characteristics of the California Department of Education’s Framework, several features specifically elaborate on the mandated teaching of history.

"This framework is centered in the chronological study of history" (History-Social Science Framework, 1988, p.4). Students need to know when and where things happen. Geography and history are constantly interacting with each other in time and place. Therefore chronology is one of many devices that historians use to organize and understand the past.

"The framework proposes both an integrated and correlated approach to the teaching of history-social studies" (Framework, 1988, p.4). Not only are
teachers expected to integrate history with other social sciences and humanities but they are expected to collaborate with teachers from other field such as science, language arts, and visual and performing arts.

"The framework emphasizes the importance of history as a story well told" (Framework, 1988, p.4). Without developing the pathos and drama of people and events of the past and their relationship to the present, history becomes dry statistics and loses all significance for today. Historical arguments are to be developed rather than glossed over. In this way students are motivated to see and explore relationships in time.

"The framework stresses the need for enriching the study of history with the use of literature, both literature of the period and literature about the period" (Framework, 1988, p.4). History and language arts teachers must collaborate in researching and selecting literature of a given era which may include: songs, plays, poetry, novels, essays, documents, legends, myths, religious literature, and biographies. By doing so the student is enriched by their values and ideas, hopes and dreams, and perhaps most importantly, how people of the past viewed themselves in their age.

"The framework emphasizes the importance of studying major historical events and periods in depth
as opposed to superficial skimming of enormous amounts of material" (Framework, 1988, p.5). With this approach students are encouraged to look beyond the textbooks and unearth the rich significance of a given topic. An integrated and correlated approach gives meaning to the age being studied.

"The framework incorporates a multicultural perspective throughout the history-social science curriculum" (Framework, 1988, p.5.). Teachers are to recognize racial, ethnic, and religious differences when studying history, whether it be local, national, or international. The experiences of various cultural groups are to be presented in an unbiased and pluralistic setting. California and our nation has always been home to many people groups (e pluribus unum) and cultural sensitivity is to be exercised when studying history.

"The framework encourages teachers to present controversial issues honestly and accurately within their historical or contemporary context" (Framework, 1988, p.7.). When presenting controversial issues, students should understand that then as now, there were many different points of view. And only when these perspectives are adequately portrayed, do students realize that issues are debatable then, as well as now. This can best be done with artifacts and primary sources of the time.
Students need to realize that historians interpret history based on primary and secondary sources and no two views of a given event will be the same. In addition, with every passing generation there is a compelling need to rethink the past and make history relevant, free from bias or emotion, for the present generation.

In addition to listing excerpts related to the teaching of history, the Framework also provides cohesive organization identifying goals and curriculum strands.

Goals and Curriculum Strands

The Goals and Curriculum Strands are designed to form a cohesive structure appearing first in the primary grades, then reappearing as students mature to graduation. The goals are introduced within the curriculum, integrating all of the strands throughout the student’s public education. A brief outline of the Framework is as follows:

Knowledge and Cultural Understanding

Historical Literacy
Ethical Literacy
Cultural Literacy
Geographic Literacy
Economic Literacy
Sociopolitical Literacy
Democratic Understanding and Civil Values
National Identity
Constitutional Heritage
Civic Values, Rights, and Responsibilities
Skills Attainment and Social Participation
Participation Skills
Critical Thinking Skills
Basic Study Skills

A closer look at the Goals of Knowledge and Cultural Understanding start with the mandated Historical Literacy strand. Within this construct students must engage in and develop an understanding of six unique areas:

**Historical Empathy**

Students are to be immersed into an historical problem to the degree that they can almost see, feel, hear, and touch the problem the way people did during that era. Only in this way, can students appreciate the circumstances, events that followed, and applications for today.

**The Meaning of Time**

Chronology is indispensable when studying events, possibilities, and constraints in time. Students need to know the terminology of decade, generation, century, era, epoch, and so on. When students have a grasp of the many developments of an era, they are more likely to make sense of the many occurrences and happenings of the past.
Interpreting history involves not just discussion what happened but why. Often observers of the time are not able to differentiate between cause and correlation regarding an event. Only after many years can insight and perspective be added to understanding. In addition, history is subject to interpretation with each passing generation thus making it highly speculative undertaking.

Continuity and Change

History is fueled by change. Most events in time are a product of change. Students need to understand that continuity is a factor opposed to change; and ideas, traditions, and values have an effect on each other. Students must understand that things might have turned out differently.

History as Common Memory

Common memory is the historical record of society that perpetuates the mores, ideas, values, and ultimately its identity for all time. In many societies around the world this historical record is closely guarded and censored for political purposes. In democratic societies checks and balances ensure the free flow of and free exchange of ideas, which impact official interpretations of historical facts.
Religion, Philosophy, and Belief Systems

Students must understand what motivated the beliefs and actions of individuals and groups; what assumptions and values they held and how this effected their ethical and moral world views. When religion, philosophy, folkways, and traditions are taken into consideration, students go away with a deeper understanding of continuity and change.

From the above discussion, it can be said that a review of the Framework reveals many characteristics and mandated guidelines as to the teaching of history-social studies in the K-12 classroom.

Next, a brief review of the Framework’s Goal of Skills Attainment and Social Participation is in order with regard to student outcomes.

In a democratic society an informed populace is absolutely necessary and civic involvement requires teamwork and cooperation for the common good. To this end the Framework is an invaluable mechanism in promoting needed learning skills towards civic responsibility. The Goal of Skills Attainment and Social Participation has three strands; Participation Skills, Critical Thinking Skills, and Basic Study Skills. Participation skills has three areas of emphasis:

Develop Personal Skills

Students should develop a sensitivity to others; their needs, desires, hopes, and dreams. Students
need to articulate their own position on issues of personal concern. The issues of bias and prejudice should be identified and clarified, differentiating the individual from typecasting of groups. Only then can groundwork be laid for effectively working with others.

**Group Interaction Skills**

These skills involve the ability to listen attentively to other points of view; planning and making group decisions; the willingness to lead as well as follow; the ability to persuade, compromise, debate, negotiate; and resolving conflicts free from aggression that undermine consensus building.

**Social and Political Participation Skills**

This involves the need to identify and act on issues of social importance; the need to exercise the responsibilities of citizenship; the willingness to work toward social change and to accept the consequences that change brings.

The second strand is Critical Thinking Skills which involves inquiry into historical and social issues before deeming them to be true. Developing an inquiring mind toward issues of social importance safeguards our democratic society from excesses. Students have opportunities to carefully examine documents and data, extracting meaning and writing
summaries based on sound research procedures. The Critical Thinking Skills strand also has three areas of concern:

**Define and Clarify Problems**

These skills include the ability to take information, define the problem, determine its validity and assess its relevance to the issues at hand. In addition, information and problems needs to be prioritized in terms of importance. Finally, questions need to be developed leading to further clarification.

**Judge Information Related to a Problem**

Students need to distinguish between fact and opinion. Just because it was written two hundred years ago doesn't mean that it is free from stereotypes, semantic slants, propaganda, or prejudice. Information should also be evaluated in terms of consistency and context from which it was drawn. In this way a construct can be developed for critical appraisal.

**Solve Problems and Draw Conclusions**

These skills include predicting consequences to an action or event; to determine if there is enough information, both qualitatively and quantitatively, to justify viable solutions and if not, to offer alternatives. Furthermore, conclusions must be tested before their implementation.
Lastly, in the area of Skills Attainment and Social Participation the need for Basic Study Skills must be addressed. Primary skills for History-Social Science include gathering, evaluating, coming to conclusions, and making sound judgments based on accepted research practices. Students also need to discuss, debate, and write clearly about their experiences. The acquisition of the following Basis Study Skills are mandated by the Framework:

1. Acquire information by listening, observing, using community resources, and reading various forms of literature and primary and secondary source materials.
2. Locate, select, and organize information from written sources, such as books, periodicals, government documents, encyclopedias, and bibliographies.
3. Retrieve and analyze information by using computers, microfilm, and other electronic media.
4. Read and interpret maps, globes, models, diagrams, graphs, charts, tables, pictures, and political cartoons.
5. Understand the special language used in historical research and social science disciplines.
6. Organize and express ideas clearly in writing and in speaking. (Framework, 1988, p. 26.)
After discussing, at length, what the California Framework mandates regarding the teaching of history-social sciences and what learning skills should be acquired by graduation, this review of literature will focus next on the role of instructional media toward this end.

**Instructional Media**

What is the role of technology in the field of history-social science? How should history-social science be taught with the use of these powerful new tools? The Framework suggests that a comprehensive history-social science program should use instructional media in three different areas: visual materials without print, auditory materials, and technology-related materials.

When speaking of visual non-print materials filmstrips, slides, videotapes, films, maps, charts, archival items (photos, drawings, sketches), and various replications come to mind. When used for instruction they should be pertinent, authentic, objective, and relevant to the task at hand. In addition, they should be appropriate and understandable to the grade level being taught. When developing an instructional program, sound teaching principles should incorporate the above media toward a compelling and high interest format.

Auditory materials include records, tapes, and CDs. They should be suitable in substance and length
of play; voices should be clear using standard English; accents, when used, should be appropriate for the role portrayed; music and/or sound effects should also be integral to the instructional goals at hand.

Technology-related materials may include educational television, interactive videodiscs and computer software. These powerful resources can be used as an ancillary compliment to basal texts or as an alternative to the same. If software is used, it must meet the standards set forth by the Guidelines for Educational Software in California Schools. If databases, spreadsheets, and other electronic communication software is used, it should be accessible to all students from servers to workstations. Internet resources should be used for research and downloading software if school districts have installed proper wiring.

In short, all technology must support the aims and goals of history-social sciences as an increasingly important pedagogical tool toward the understanding of our world.

**Technology in History-Social Science Instruction**

The role of technology is changing the environment of the Social Science classroom. It is giving way to a computer-based, interactive, setting in which collaboration, inquiry, experimentation, and reconstruction are more of the norm than the
traditional lecture, note taking, and exams. Through the growing resources available, students are now able to create their own elaborate presentations, whereas before they were confined to paper and pencil responses.

Fifteen years ago, technology meant cassette recorders, LPs, 16mm projectors, film strips, and slide shows. By the mid 1980’s, microcomputers were being introduced in the classrooms as a new aid to the various forms of instruction. This became known as computer assisted instruction (CAI). "Applications of individualized CAI can be categorized in a number of ways. The most common categories of software fit within our basic instructional approaches: drill and practice, tutorial, simulation, instructional games, and problem solving" (Newby, et al. 1996, p.228). Most classrooms, at that time, had no access to computers. And those teachers who were fortunate, took it upon themselves to learn the system, often with the help of their students.

A dramatic departure began to develop through CAI. Before computers, previous technology in the form of videos, records, and films, did not allow the viewer or listener to respond to the various stimuli. The student remained a passive recipient of media. With CAI, students began to communicate and respond to the programs. The evolving interactivity began to stimulate thinking toward new perceptions and
possibilities. CAI began to develop and change; the colors began to multiply; graphics began to improve; sound was introduced and the once peculiar glowing box began a metamorphosis toward a promising tool in the history-social science classroom.

What, then, is the potential for technology in teaching and learning in the Social Sciences. Willis (1996) reports three recent studies that investigated the use of technology in social studies. Project ICONS (International Communication and Negotiation Simulation) a computer assisted simulation developed by the University of Maryland allowed high school and college age students to assume the role of negotiators and policy makers in the search for real world problems such as world health, nuclear proliferation, and human rights. Students were tested before and after simulation scenarios to determine their knowledge of global issues. From the beginning students exhibited little knowledge of the issues or related vocabulary. By the end of the program students were able to elaborate, at length, on these issues. In addition, the reading of current events significantly increased during and after the simulations demonstrating a heightened interest in international affairs. Thus, the researchers reported that the ICONS problem-solving approach to current events encourages a high level of communication, language skills, and reasoning capabilities needed in
today’s complex interdependent societies. Motivation was also enhanced when students were able to participate in real world issues.

The second study called Archaeotype was conducted in 1994 by Columbia University in conjunction with sixth graders at Dalton School. Students participated in a simulated archaeological dig. The researchers compared the ability and performance of students using Archaeotype in their investigation with students not using the program. Results of the study showed students using Archaeotype performed 73% higher in the explanation and argumentation areas, than those who did not. "The Archaeotype students displayed a high ability to create explanations for their observations as well as argue their validity by mixing concepts and terminology from the simulation with their own terms and ideas”.

The third study reported by Willis (1996) compared eighth grade social science classes using computer simulation with a control group receiving traditional curriculum instruction. The control group was limited only to drill and practice or tutorials without the added simulation software. “The study focused on small-group discussion to determine whether the topics and lengths of discussion differed categorically and quantitatively between those who were taught skills in decisions making and those who
were not" (Willis, 1996). *Colonization* by Tom Snyder Productions (1996) was used and transcripts reveal that students using the software were much more engaged in relevant conversations related to the topic than those who were not.

From these three studies investigating varied uses of simulation technology in Social Science, research clearly shows than students using the software communicate better, use the language more skillfully, and demonstrate involvement in higher order thinking more often. This shrewd use of technology conforms with the California Framework in preparing our students to be fully aware of and engaged in constructive dialogues regarding the complexities of our democratic society.

**History-Social Science Software**

**Assessment and Domains**

It is encouraging to note the growing volume of social science software in the CAI marketplace. Titles abound in history, geography/atlases, crosscountry treks, social and cultural issues, adventures, time travel, databases, almanacs, and game formats. In addition, software producers are mixing and matching the above domains in an increasing effort to address the holistic nature of social sciences while accommodating the instructional issues of learning modalities.
With these interesting and ever-increasing software packages some fundamental questions need to be addressed. How are parents and teachers to choose from the growing volume of titles? What criteria are they to use to determine good or bad software? To be sure there is no one guideline or evaluation form to fit all programs. An instrument could be developed that would include only broad guidelines and allow the evaluator considerable leeway in interpreting and applying them. On the other hand, an instrument might have a long list of specifics and a complex scoring system, leaving little to the judgment of the evaluator (Forcier, 1996).

A different approach to addressing these complex questions was initiated by software designers at MUSC (Medical University of South Carolina). In the initial planning of two CD-Roms focusing on environmental careers for middle school students, the team discussed instructional design; development of goals and objectives, presentation of content, and methods of evaluation. In addition, an audience analysis was to be conducted. The developers were primarily interested in what students liked in computer programs. They approached the problem in two ways. One was to go directly to the schools and conduct interviews with the students. The other was to include them in the formative evaluation process.
After comparing notes from existing standards in instructional design and responses from students, developers saw many corollaries. Students wanted clear directions, top notch graphics, a challenging format, and control over the program (Mauldin, 1996). In addition, they requested a brief introduction. Lengthy introductions undermine the initial factor of motivation. What is clear is the fact that students intuitively know basic principles of instructional design. In all likelihood, the team would have incorporated standard elements of design into the two CDs. But it was admitted that the students gave perspective and a concrete rational for their desire to have choices, control, and suggestions for a visually appealing and challenging interface. Success was measured, by the fact that, after the software was produced, 95% of those very same students took the course, met the objectives, and reported that they enjoyed the format. The developers agreed that this kind of success could not have been achieved without the detailed input from the student audience. The implications are clear. Software assessment needs to include student perspectives; not only in formative evaluations, but in software selection as well.

When assessing software for instruction, the following questions must be asked: Does it fit in with my curriculum? How easy is it to use? Is it intuitive or do I have to learn code or some cryptic
language? Do I know where I am in the program at all times? Graphics, sound, music, animation; do they enhance the objectives of instruction? What about the natural eye flow from left to right; Asian students read up and down. Is this a concern? (A. Piña, personal communication, June, 1997).

**Types of History-Social Science Software**

As previously stated, the field of History-Social Science software is growing rapidly. Offerings have increased in a number of instructional domains such as: tutorial programs, drill and practice, simulations, educational adventure games, problem-solving software, database programs, cooperative learning, and multimedia. In addition, developers are beginning to combine the distinct domains to increase interest, utility, and interactivity. The three most commonly seen domains (tutorial, drill and practice, and simulations), will be discussed.

**Tutorial Programs**

As part of the CAI options for the classroom, tutorial programs assume little prior knowledge of a topic and teach from a clear slate; imparting new facts and knowledge. Increasingly, tutorials are combined with databases, references, and game formats to increase attention and motivation. Tests are given after major concepts have been taught and, in addition, the student usually is able to regulate the
degree of difficulty to suit their needs. One example of a tutorial is Talking USA Map by Orange Cherry (1996). The highly detailed graphics of each state shows the topography, borders, and even moving bodies of water. A digitized voice pronounces the names of each state and facts are given about history, land, industry, and political characteristics. This self-paced tutorial allows students to progress at their own pace and to take a quiz on state capitals when they are ready. Suggested use is grades 4-9.

Another program U.S. Geography Series CD by Clearvue (1996) encourages students to explore the United States. Each CD, focusing on seven regions of America, contains an audio visual presentation with text links to a 24-volume student encyclopedia with glossary terms. In addition, multiple-choice questions are available during the presentation or after in a quiz or exam format. This tutorial and database format is suggested for grades 4-9.

Broderbund's Mieko: A Story of Japanese Culture CD (1996) is a tutorial introducing students to Japanese culture and language. In the process, students can also learn introductory French, Spanish, and German while accessing information about these language. This tutorial/reference tool is suggested for grades 4-up.

Another tutorial for the elementary grades is Dinosoft U.S. History & Geography CD by Maverick
Dinosaur characters lead students across the country learning facts about states, capitols, explorers, presidents, state abbreviations, and timelines. Enhanced graphics, sound, and music bring the lessons to life. In addition, the dinosaurs interact with students developing knowledge and self-confidence.

**Drill and Practice**

Drill and practice software is different from tutorials in that they assume prior knowledge of a concept or skill and they teach for mastery. Students can usually choose their own level of difficulty from various question formats. The most common of which is the multiple choice. Also familiar to this type of software is reinforcement. Reinforcement could simply be in the form of a speech bubble saying, "*Way to go Joe! You’re on the right trail.*" Or an option to play a brief game might appear. Reinforcement may also be in the form of directional clues. If the student has made a wrong choice, suggestions will appear to question the choice or applaud a decision.

The design directive here should always be positive reinforcement. When this is given, students feel less stigmatized and therefore more inclined to continue the program. Also, drill and practice should have variations on a given skill so if the student wants or needs reinforcement, similar problems are available. Teacher assessment options are available.
that record student progress with printouts. As with tutorials, the current trend in software design is combining drill and practice with game formats.

National Geographic's Geo Bee (1996) is drill and practice in a game format. It is designed for up to four players and has three rounds of play. Thousands of questions are drawn directly from the National Geography Bee. An animated character leads students through the rounds as they improve their knowledge of world geography. Suggested for grades 5-up.

Another drill and practice software, Micrograms' Faces and Places (1996), has a game show format. A host guides one, two, or two teams in testing their knowledge on capitals, geography terms, U.S. cities, regional states, explorers, Native Americans, famous women, African Americans, presidents, the American Revolution and more. There is also an option for students to enter data for additional game categories related to their community and curriculum. This is for grades 3-up.

Though tutorials and drill and practice software began the interactive revolution, simulation software added a new dimension.

Simulation Software

Simulation software attempts to represent a system, or model of a real world phenomena. It began with the airline industry and the military. Corporations and the government invested heavily,
preparing pilots and other specialists to operate expensive machinery. This extended to the space program preparing astronauts and scientists for missions in weightless environments. As computers developed and matured, so did the software that controlled them. Simulation software is now used for most research and development projects including the entertainment industry for theme park ventures such as Magic Mountain, Disneyland, and Universal Studio Tours. For education, the strength of simulation software is not only enhanced multisensory understanding, but the potential for problem solving applications.

"As we noted earlier, a simulation is a representation or model of a real (or sometimes imaginary) system, situation, or phenomenon" (Newby, et al. 1996, p.230). Simulation software allows the student to interact in a situation-adventure format permitting them to experience realistic settings while overcoming situations or barriers as they vicariously interact with the challenges of the program. Students are given a scenario and tasks to fulfill. They are required to plan and make decisions. Consequences also result from informed or ill-advised decision making.

In Africa Trail by MECC (1996) students plan and participate in a bike trip across the continent of modern-day Africa. In the process they encounter many
peoples, and places. Critical thinking skills are
developed in their decisions to convert currency,
manage their budget, and bargain for provisions along
the way. In so doing, students learn of the
geography, culture, and history of the continent.

*Oregon Trail II CD* by MECC (1996) has
produced an enhanced version of its original *Oregon
Trail*. Students choose what mid-18th century
character they want to be for the duration of the trip.
Each character, though, has its own strengths and
weaknesses and all of those attributes will be needed
for survival. The student chooses between three
different trails; Oregon, Mormon, and California
trails. They also must choose their beasts of burden;
horses, mules, or oxen. Each animal also has its
strengths and weaknesses. Add this to several levels
of expertise, bad weather, health problems, not to
mention unforeseen hazards and you have a highly
interactive problem solver in the context of history-
social science.

In some instances software producers, perhaps
being pressured by the marketplace to produce, make
claims that are hard to believe. *American Revolution
CD* by Entrex (1996) makes some rather outlandish
claims in their advertisements.

"Play a role in the founding of a new nation!
Live as a Puritan in Massachusetts Bay in 1630.
Become an active member in the House of Burgesses."

One wonders, with promises like these, as to the level of software credibility, especially with suggested grades being 4-9.

On the other hand, good software like Silk Road CD by DNA Multimedia (1996) has won recognition from International Digital Media, receiving the 1996 Gold Medal for Best Photography, Best Consumer Enrichment, and the People's Choice Award. This simulation software combines a game format as students travel the ancient trade route that connected the east to the west. Students explore peoples, religion, philosophies, history, languages, explorers, and trade routes of the old Silk Road. It is suggested for grades 6-12.

Multimedia Teaching and Learning

All of the above software producers make good use of multimedia. But how is multimedia being used in teaching and learning? Does it really enhance learning, and if so, in what way? And how does that impact achievement in the social sciences?

"Multimedia instruction can be loosely defined as educational programs integrating some, but not necessarily all, of the following media in an
interactive environment controlled by a computer: text, graphics, animation, sound, and video" (Barron & Orwig, 1995, p. 2). With this definition, one needs to realize the rapidly evolving hardware, software, and telecommunication technologies. Computers are faster, cheaper, smaller, and more versatile than just a few years ago. The software grows more intuitive with each new upgrade and the accessibility and transmission of information is progressing so much that some are referring to the present as the beginning of the Communication Age (Betts, 1994).

Despite these rapid advances, many schools have changed very little in the last fifty years. Fortunately, new trends indicate access to computer, videot disc players, CD-ROMs, and networks are on the increase. A survey conducted by Quality Education, Inc. showed that over half of the school districts responding to the survey reported using educational multimedia for instruction (Looking Ahead: A report on the latest survey results, 1995).

Another encouraging development is the increase in teacher training. Sixty-three percent of districts surveyed were planning 1-10 hours of inservice, and 19 percent were planning more than 10 hours of training per teacher. This is a significant improvement from previous years (Brady, Salpeter, and Hoffman, 1993).

The government has recently demonstrated a commitment to raising educational standards with
regard to technology with the Goals 2000, Educate America Act of 1994. This is a major initiative to integrate technology into the content standards of the social sciences of our nations' schools (MacDonald, 1994).

Benefits of Multimedia Instruction in Social Science Education

Much of the technology-based research measuring student achievement have used programs utilizing drill and practice or tutorials. These limited studies report only a modest, but positive, influence on student achievement with a substantial reduction in instructional time over traditional methods (McNeil and Nelson, 1990; Kulik and Kulik, 1991; Rockman, 1992).

In addition, the public is often disappointed when they discover the complex nature of assessing the effectiveness of various technologies. They discover that it is not as simple as giving out a standardized test (Barron and Orwig, 1995). Increasingly, educational multimedia programs that deal with social-science topics are designed toward an inquiry and discovery format rather than tutorials or drill and practice. Naturally, assessment using comparison studies and paper and pencil multiple choice questions are not adequate in measuring the effectiveness of this new medium. Also, many of the new and different
networking technologies, related to multimedia, have not been thoroughly evaluated which complicates the research. Despite these shortcomings, a number of benefits are evident, based on technology's characteristics, teacher's views, and published research.

**Multisensory platform**

In recent years, the issue of various learning styles have been expounded upon at length. Some students are said to be audio learners, benefiting from sound and narration. While others are visual learners, thriving on art work, graphics, and text. Multimedia instruction addresses this need to teach to the various modalities of audio, visual, and kinesthetic. This allows students to assimilate and apply their new-found knowledge (Holtzberg, 1994).

**Increased active learning and self-expression**

Recent software is bringing history to life. Instead of reading a text about events in time, students can view video clips, see sights and sounds, and analyze the primary source documents related to the events. In this way history becomes multidimensional. In addition, some programs like *Vital Links* by Broderbund (1995), allow students to reinterpret history based on those very same primary sources, not only reliving the time but developing points of view not before considered.
Apple Computer, the National Science Foundation and the National Alliance for Restructuring Education conducted a long-term research project. Their findings revealed that students actively involved with technology had a "higher degree of social awareness and self-confidence; they were more independent and had more positive attitudes about learning and themselves; they were able to experiment and problem solve with greater ease; they saw themselves as collaborators and experts, and they had a positive orientation about the future" (Apple Computer, 1991, p.3).

Critical Thinking

Technology has been proven to promote higher level thinking skills. One program, the Jasper Woodbury series, was designed specifically to promote problem-solving skills (Cognition and Technology Group, 1993). Telecommunications and hypermedia also effect thinking skills. Students' inquiry and analytical skills are increased with the use of telecommunication (Honey and Henriquez, 1993). Multimedia social-science simulation software promotes inquiry, analysis, synthesis, and application; all of the higher level thinking skills of Bloom's Taxonomy. This can be beneficial for instruction that involves problem solving, decision making, and other critical thinking skills (Steinberg, 1992).
Cooperative Learning

"Introducing technology into the learning environment has been shown to make learning more student-centered, to encourage cooperative learning, and to stimulate increased teacher/student interaction" (Interactive Educational Systems Design, 1994, p.2). Many of the multimedia simulation software programs reviewed earlier have options for group work. Digital Chisel's Continent Explorer II (1996) provides environments and supplies for small group activities. Where cooperative learning and technology have merged, positive results emerged. The research supports the use of group activities to increase instructional efficiency and social interactions (Schlechter, 1990).

Self-paced learning

All students learn in different ways. The beauty of technology is that students can progress at their own speed and not have to worry about peer pressure or impatient instructors. Technology offers options for self-paced learning and allows students to progress at their own pace in a non-threatening environment (Peck and Dorricott, 1994).

Communication

Students with disabilities can express themselves much more than in the past. Technologies such as adaptive hardware and software, voice recognition software, and text-to-speech synthesis are providing
the opportunity for physically challenged students to express themselves as never before. "More and more success stories are pouring in about how technology, combined with effective practice, can help students with disabilities overcome barriers to their success" (Zorfass, Corley, and Remz, 1994, p. 62).

**Multiculturalism**

Today, students can communicate with other likeminded students in distant locations. UNESCO and other United Nations educational exchange programs offer a host of options for distance learning projects. In addition, this is proving to be cost effective when comparing e-mail with standard postage 'snail mail' rates. Also, project interest remains high as correspondence increases. Students can grapple with world problems from a multicultural perspective. "Indeed, never before could teams of students, thousands of miles apart, engage in a dialogue through which they jointly construct a model of their respective economics, cultural surroundings, or ecologies, and then collaboratively test its implications" (Salomon, 1991, p.43). These implications are described in the next section.

**Motivation**

Multimedia enhances learning by motivating students and teachers to view their world from different perspectives. Student absenteeism was almost reduced by half among the 216 students who
participated in the Apple Classrooms of Tomorrow (ACOT) study in Columbus, Ohio (Dwyer, 1994). Studies that shown students work longer and enjoy persisting on task with technology, may have a long-term benefit for themselves and society (Summers, 1990-91).

Despite the many applications of a multimedia enhanced environment, its potential is just emerging. Today’s teachers need training to learn the skills of producing multimedia lessons, demonstrations, and presentations. Only then will they fully realize the many benefits these dynamic instructional tools offer to the history social-sciences environments.

Finally, teachers need to be knowledgeable facilitators in providing guidance for students who want to create their own interpretation of current or historical issues and events. The authoring of social-science software by teachers and students is an exciting trend that can only gain momentum as online resources, CD databases, and primary sources become more assessable to the public. But what tools are necessary for authoring? What are the capabilities and benefits in education?

**Authoring: Tools of the Trade**

What is authoring? What are the benefits and capabilities of authoring? What are some of the more popular authoring tools on the market? This next
section will define and explore the potential of authoring and the software needed to create multimedia programs.

What is Authoring?

*Computers in Education* defines an authoring system as “an integrated set of tools designed to simplify the programming process, which allows non professional programmers to develop computer-based, multimedia programs” (Merrill, et al. 1992, p. 224). In addition, the term hypermedia is often discussed. Hypermedia programs are the tools or delivery systems for authoring. Hypermedia can also be defined as “Programs that delivers information through multiple connected pathways. Hypermedia allows students to branch seamlessly among text, graphics, audio, and video” (Barron, & Orwig, 1995, p.155).

Capabilities and Benefits

Developing multimedia programs afford many capabilities and benefits for teachers and students. With the help of a projection system, computerized slide shows can be developed, modified, presented, and stored much easier than in previous years.

Teachers now can assess student progress by creating invisible buttons for right and wrong answers. Positive and negative sounds can be added for auditory reinforcement and direction.

Authoring systems include the ability to control videodiscs, sounds, and CD-ROMs, however, most of
these multimedia options can now be stored on the hard drives of a server, individual computer, or on a CD.

Many of the authoring systems have the option of creating handouts from databases or screens within the programs. The Print Stack feature of HyperCard allows developers to print from 1 to 32 computer screens on the same sheet of paper (Barron, et al. 1995).

Most authoring programs were originally designed as database managers, thus storage and retrieval of information from various formats is an appealing option when organizing media (Barron, et al. 1995).

Cross-platform compatibility from DOS/Window to Macintosh has developed and now enables users to create a project on one platform and view it on another. HyperStudio and Digital Chisel offer this advanced feature.

Copyright and licensing restrictions have inhibited distribution of software in the past. Today, however, most authoring programs allow the free distribution without licensing agreements. Projects can now be displayed through shareware, on bulletin boards, or over the net.

Authoring Tools

Many reasonably priced and simple to use authoring tools have developed in the past ten years. HyperCard, introduced by Apple Computer, initiated the desktop multimedia revolution. Some of the well-known ones for Windows are Toolbook and Linkway. Digital
Chisel and HyperStudio, as stated earlier, are cross-platform compatible, operating in both Windows and Macintosh environments.

These authoring systems are very similar. Information is presented on a screen or card. Cards can be arranged either linear or non-linear. They are then grouped into a stack of cards. Navigation is usually done by clicking a button visible on the screen, however, invisible areas can also be used for designated action. Buttons are also used to control the actions of internal or external devices. Perhaps the greatest strength of authoring interactive multimedia is that "it is a tool for students to gather their own information, construct their own knowledge, and communicate their ideas effectively" (Forcier, 1996, p. 257).

HyperStudio

One of the most popular authoring tools on the market, HyperStudio (Roger Wagner Publishing) was originally designed for Apple GS and Macintosh. It now fully supports a Windows version. The Mac and Windows versions require a hard drive and a minimum four megabytes of RAM (Random Access Memory). The structure develops from cards and stacks containing text, graphics, and sounds. Buttons, both visible and invisible, control the action. Pull down menus and dialog windows are used to develop applications. Thousand of color options are available in addition to
color clip art. This award winning program includes built-in links to videodisc, CD-Audio, QuickTime movies, and digitized audio. It can, also, track correct and incorrect answers (Barron & Orwig, 1995).

Conclusion

This chapter presented discussion of topics that will be applied to this project. The project using a social studies tutorial, database format, will be built around the context of Russian involvement in early California history. It will be developed to support the California History Social-Science Framework while applying multimedia features from the authoring tool, HyperStudio.
CHAPTER THREE
GOALS AND OBJECTIVES

Goals

The first goal of Colonial Russia in California History is to provide students with a unique perspective, from the standpoint of Russian involvement, in the early days before California's gold rush and statehood.

Another goal is to provide information through a variety of media: text, illustrations, sketches, drawings, paintings, sound, song, and video so that the students will have a richer experiential understanding of the era.

The last goal is to design a multimedia tutorial that is hyperlinked and interactive.

Objectives

The students will be able to articulate the significance of Imperial Russia's colonial experiment in the Americas and more specifically in California. In addition, the students will be able to discuss what caused the Russians to travel so far from Mother Russia; what was their reasons for being in California; and what caused them to leave. The students will, also, be able to explain international ramifications of Russian colonial interests in California and North America.
The following section lists the instructional objectives of the multimedia project:

(1) Students will demonstrate, orally and in writing, increased knowledge and understand of the topic, Russian eastward expansion, and colonization in North America.

(2) Students will explain what drove Russian expansion across the arctic, into Alaska, and down to California.

(3) Students will list three reasons why the Russian colonists (mercantile trading venture) came to Alta California.

(4) Students will retrace the events that led to Spanish concerns over Russian encroachment in Spanish America and eventual Spanish exploration and colonization of Alta California.

(5) Students will be able to discuss the Tzar's charter of 1799 and tell how it empowered the Russian-American Company.

(6) Students will be able to identify the name of the local Indian tribe that sold land to the Russians for the building of the settlement called Fort Ross.
(7) Students will state how the Kashaya Pomes interacted with the settlers and why.

(8) Students will explain the Tzar's reason for enacting his ukase (edict) of 1821 and how it effected the development of American legislation and major foreign policies from 1823 to present.

(9) Students will list six problems why Ross Colony began to loose profit and tell why they finally left.

(10) Students will identify and distinguish between the various ethnic groups involved: Kashaya Pomo, Aleuts, Russian, Spanish, and Mexican colonists.

(11) Students will identify on maps, where key geographic and historical regions are: Siberia, Alaska, California; as well as significant locations on regional California maps.

(12) Students will be able to list major events on a time line pertaining to the area of study.
CHAPTER FOUR
PROJECT DESIGN AND DEVELOPMENT

Description of the Project

Colonial Russia in California History (CRCH) is an interactive, self paced, multimedia tutorial about the Russian involvement in early California History. The project developed out of the author's goal to address a need for instructional materials on California's early multicultural heritage. Within this focus, it also describes early interactions with Alaskan natives, the Kayasha Pomo tribe from Northern California, Spaniards, Mexicans, and Americans.

In addition to the three lessons on this era, multimedia databases and activities that revolve around given historical events are also included. The databases contain maps, historical songs, video clips, information on the Kayasha Pomo tribe, and an extensive timeline. These resources can serve as enrichment materials or secondary topics of study on California's rich heritage of multiculturalism.

Users

Primarily, Colonial Russia in California History was designed for the California fourth grade curriculum because this is the year that California History is taught.

Students in the fourth grade are generally nine to ten years old. In this grade they are being
introduced to a number of new topics in the area of history/social sciences, some of which are: geography, anthropology, history, economics, and current events. With this initial background, students reading at fourth grade level should have no trouble understanding CRCH's various text screens.

The computer skills needed for this project include: ability to turn on and off a computer, use a mouse, and navigate with buttons and scrollable text. There is no need for any computer scripting language to operate this product.

Structure

Colonial Russia in California History starts with a title screen which leads to the main menu screen. The menu screen shows three lessons on the subject, five databases, a credits button, and an exit button. These also serve as the main navigation buttons.

The three lessons contain information about Imperial Russia's colonial involvement in the early days of California. Each lesson starts with an objectives screen. This informs the student as to what they are expected to learn. The student then proceeds through the various information screens, and their links to databases, exploring all it has to offer. At the end of each lesson there are questions that parallel the objectives given at the beginning of each lesson. This is intended to help students measure their understanding of the lesson.
All three lessons have the same basic structure: objectives, body of lesson with access to databases, and review questions. The five multimedia databases, namely, Music Room, Pomo Info, Map Room, Timeline, and Video Clips, support the content of CRCH in several ways.

In the Music Room, six authentic songs from early California history were selected to support the multicultural theme of CRCH and provide an opportunity for users to hear songs of various ethnic backgrounds that relate to the region and era. They are: Grass Game Song; (from the Pomo Indian tribe); El Cantico del Alba; (an early Spanish Missions song); Cielito Lindo; (an old Mexican song popular among the Californios of the ranchos); John Kanaka; (a Polynesian Sea Shanty); Beryozonka; (a very old and beloved Russian folk tune); and Kalinka; (a Russian folk dance tune). These songs are also linked to respective lessons where related topics are discussed in the text.

Another database is completely devoted to the Pomo Indians. The Pomo Info database is important because it gives the users needed background about the California Indian tribe that made initial contact with the Russians and sold them land so they could hunt and build a settlement at Ross (Fort Ross). The discussion is anthropological in nature and is crafted in the form of a series of questions. They are: Who
were they? Where did they live? What food did they eat? What was there shelter? What did they wear? Did they have boats? Did they use money? Were they basket makers? Did they play games? Did they have ceremonies? What did they believe? It is through these questions that learners understands the Pomo Indian tribe of that era.

The next database focuses on the geography of CRCH. The Map Room database provides seven maps related to the discovery and colonization of North America in general and Russian colonial efforts in particular. When learners click on a map, they go to a lesson where that map illustrates the text of that screen. This is true with most of the maps. Learners actually go to different parts of the program and view the maps in context to the lessons they are in.

The map button, North Pacific, takes users to Lesson 1 and shows the entire northern Pacific Ocean, China, Siberia, Bering Sea, Alaska, and California. It is useful in showing geographic relationships and the great distances traveled by sailing ships.

The map titled Indian Tribes shows the various regions in central and northern California where Indians lived before the Europeans came. This map is useful in that it shows the region of the Pomo Tribe along the California coast north of the San Francisco Bay Area.
The map, *Spanish Missions*, shows the chain of missions established by the Spanish during the late 1700's and early 1800's along the old El Camino Real (The King's Highway). The Russian colony at Ross was established just north of these missions.

The icon, *North America 1820's*, takes the student to Lesson 3 where a political map of the continent is displayed, labeled, and color coded. This map shows the extent of Russian colonization in Alaska along with many other boundary and treaty lines of the early 1800's.

Another map titled *San Francisco Bay Area 1821* shows the various Russian enterprises established north of San Francisco as well as the Presidio and Spanish Missions of the region.

*Old Russia* is an authentic replica of the Map of Imperial Russia dated 1717. It was purchased in 1977 in Vienna, Austria. The cartographer is unknown but it was made during the reign of Peter the Great and is included courtesy of the author.

*Ross Colony* is the last map linked to the Map Room. When clicked, it goes to Lesson 3 and shows the various regions of the colony. The Kashaya Pomo neighborhood is just north of the fort and is the largest. The native Alaskan neighborhood is south of the fort close to the shore. The Russian village was
northwest of the fort. The unique relationships and interactions of these peoples are discussed in the text of this screen and the lesson.

The next database is the Timeline. It begins in 1542 with Cabrillo’s discovery of California for Spain and ends with Russia selling Alaska to the United States in 1867. There are 31 entries spanning over 300 years of California history and all related to the Russian colonial venture in California.

The last database included in CRCH is the Video Room. Three realtime video clips are offered. Aleut Whaling, Aleut With Spear, and Russians in California. All three clips are voice over commentaries by Park Ranger Dan Murley of the Fort Ross State Historic Park. The actual dimension of the clips are 2x2 inch.

Aleut Whaling is connected to Lesson 2 and when clicked, one hears Park Ranger Murley commenting on a painting by Mikhail Tikhanov (1789-1862) of an Aleut in a small kayak (bidarka) hunting a whale. This clip gives insight into the techniques of the native Alaskan hunters who were employed by the Russians throughout Alaska and California. Another clip from Lesson 2, Aleut With Spear, also by Tikhanov shows a hunter standing with spear (atlatl) in hand. Again, Ranger Murley goes into detail about the technology used by the natives and the unique cloths they wore. These interviews shed light on the hunters of fur bearing mammals.
Russians in California is the last video clip with Ranger Murley and is a good brief summary of Russian involvement in California history. Ranger Murley uses a pointer and a real Russian map of California found at Ross to guide the viewer to important places relevant to his discussion. It is linked to Lesson 3 and also ties in with the text of the lesson.

These hyperlinked databases are useful in that they provide enriching ancillary sources of information from which the player can access in their study of CRCH.

The following sections provide a more detailed discussion of the parts and objects used throughout CRCH.

Cards/Screens & Stacks  Cards are the basic units of CRCH and they incorporate media from a number of sources to provide art, sound, video, and text that support the content and objectives of each lesson on Russian involvement in California history.

Colonial Russia in California History is made up of groups of cards organized into stacks. A stack holds a complete lesson. Stacks are linked so users can go from lesson to lesson. This linkage usually involves some time delay, (approximately 2-3 seconds) because the computer takes a few moments to go from one stack to the next.
Buttons and Their Functions. Buttons are used in CRCH to serve as navigational devices that will take the learner through the program. The following describes the types of buttons used in CRCH.

(1) Main Menu buttons take users to the 3 main lessons and the six enrichment databases (Map Room, Time-line, Video Clips, Music Room, Pomo Room, and Credits) of CRCH. Beyond the menu screen, return-to-Main Menu buttons are also provided on all major screens.

(2) Objective and Question buttons are found at the beginning and end of each lesson. These buttons can immediately take users to the beginning or end of a lesson, bypassing the information screens of the lesson.

(3) Toggle buttons are provided so users of CRCH have the option to display or remove display of text. This is useful when learners want to view graphics for support of text and/or enrichment of content.

(4) Picture and Artwork buttons go to ancillary screens that help illustrate or expand content and are directly linked to the lesson the user is working in. These buttons are linear and do not branch elsewhere.

(5) Database buttons lead users to a collection of maps, songs, video clips, as well as more information on Pomo Indians and a timeline.

(6) Navigation buttons are of three types: left and right buttons, back to lesson buttons, and exit buttons.
Left and right arrow buttons (icons) are used to take users to the next or previous screen. They are used for linear navigation and do not branch to other screens.

Back-to-Lesson buttons are found in the databases. They help the students return to lessons from databases. A lesson number is clearly marked next to these buttons so that users know to what lesson they are going.

An Exit Program button allows learners to go to a pre-exit screen that verifies if the user really want to exit the program or go back to the Main Menu. If users choose Exit, the session is ended. The Exit button is only to be found in the Main Menu.

Multimedia Features. In addition to buttons, CRCH’s structure also includes multimedia objects (See Appendix A, B, and C, for copyright permissions.)

1. Text fields hold the primary information for titles, credits, directions and lesson content.
2. Graphics for visual enhancement include: illustrations, maps, portraits, sketches, and drawings.
3. Quick time video provides full motion video and sound that enhance delivery of information on related topics.
4. Music is used in the lessons to establish and sustain suitable ambience while learners are exploring. Users can turn it off as desired. In CRCH,
Spanish, Mexican, Russian, and American songs from different lessons are linked to form a database. At the same time, these audio features support content that is expounded on in each lesson.

Technology Requirements

CRCH can be played on Macintosh computers. A minimum 24 MB of RAM is required in all host computers. The program also requires four fonts: Lightfoot, Goodfellow, Wrangler, and Palatino. These fonts will be provided in a separate folder and should be installed in the host computer's fonts folders before play begins. Currently, HyperStudio Player must also be installed first and will be included with the program.

A multimedia computer is required to take full advantage of the sights and sounds of this richly interactive multimedia program. The Macintosh version of Colonial Russia in California History is available on CD (See Appendix H), therefore, a minimum 2X CD-ROM player is required. A 15" color monitor is also required.

Project Design

Navigation

The interface of CRCH was designed to be as simple and easy as possible so that the learner can focus on learning and not be distracted with contradictory or confusing elements.
A good example of this is the organization of buttons or icons in the Main Menu (see Figure 1). This screen has two vertical columns of icons. The column on the left shows buttons that go to the Title, Lessons 1-3, and Credits. The column on the right shows buttons that go to the databases: Music Room, Porno Info, Map Room, Timeline, and Video Clips. Organizing the lessons separate from the databases in the Main Menu is expected to help learners navigate easily through the program as well as help organize ideas.

In addition, an Exit Program button is offered in the Main Menu and is located in the lower left corner of the screen. When clicked, it takes the user to an intermediate exit screen offering the final option to return to Main Menu or Exit Program. These icons are always located at the bottom of the screen.

In CRCH, locations of icons are consistent throughout the program. In the three lessons, the icons are always placed at the bottom of screens (see Figure 2). Exit or Menu icons can be found at the lower left of the screens. The Text icons are next to the Menu icons at the bottom left. The bottom right is reserved for arrow icons that take the user back and forth to adjacent screens in a linear manner.

In between the arrow icons, a box tells what lesson the user is currently in. This is quite useful
Figure 1. Main Menu

Figure 2. Sample screen showing buttons at bottom
when the user is going to and from the databases or when they are exploring CRCH in a non-linear manner.

Other icons at the bottom center of many screens perform various functions and are clearly labeled. An example of this are the buttons to be found at the beginning and end of each lesson. They are the Objectives and Questions buttons. When clicked they take the user to either the beginning or end of each lesson, thus bypassing the need to go back to the Main Menu and reenter the lessons (see Figure 3).

![Lesson 1 Exploration and Discovery Objectives: After completing this chapter you will be able to: 1. List the two reasons why Peter the Great sent Vitus Bering to the Pacific Ocean. 2. State why Russian frontiersmen came to Alaska. 3. Summarize the events leading to Spanish colonization of Alta California.](image)

Figure 3. Objectives and questions screen
In this way the user can toggle back and forth within lessons reviewing information and comparing questions with objectives.

Music and sounds are also included in many parts of the program, but if the users wish, they can turn off the sounds with the use of the Sound Off buttons.

Many icons will take users to other screens within the lessons or to the multimedia databases. Also, icons take users to view and read ancillary screens directly related to the current text. These pictures sometimes have their own text and return the user back to the previous screen. All of these buttons are located at the bottom of the screens. This organizational structure of icons makes the interface user-friendly.

The navigation of databases was designed to be equally easy to use. Due to the number of options available in two databases, Music Room and Map Room, the organization of icons are more similar to the Main Menu screen than the lesson screens.

In the Music Room, two columns of buttons are shown. The column to the left indicates the types of songs available and when clicked play the given songs. The column to the right shows the user where the songs relate to the text in the various lessons and when clicked will take them there.

The Map Room database (see Figure 4) also has two columns. The column to the left shows buttons that go
to generic maps: the North Pacific, Indian Tribes of Northern California, Spanish Missions, and North America 1821. The column to the right is more related to Russian colonial involvement: San Francisco Bay Area in 1821, Old Russian Map 1717, and Ross Colony.

Figure 4. Map Room

The Timeline database is organized in one very large scrollable collection of key events related to CRCH. The events are dated and organized so users have the option to search chronologically for specific information. A Main Menu return button is also provided in the lower left corner. In two other databases, Pomo Info, and Video Clips, the icons are clearly labeled, consistently located at the bottom of
the screen, and provide predictable paths of navigation to and from instructionally appropriate areas of CRCH.

Screen Design

In Colonial Russia in California History, various design elements were used to create symmetry, continuity, variety and an atmosphere of historical authenticity. Within this construct, there are three basic designs: menu design, lesson design, and text design.

(1) A menu design was applied in the Main Menu, Music Room, and Map Room. The similarity among these screens is that the icons were structured into columns. The use of icons in columns was designed to convey symmetry and order. The top icons, listing lessons, songs, and maps, come first in the program, while the bottom icons come last. This approach lends continuity to the menu design and supports the purpose of the menus, that being a gateway to other parts of CRCH. The background screens vary from menu to menu because they reflect the content therein.

In the Main Menu the background screen is a full color drawing of an old double headed eagle of Imperial Russia. This visual motif was selected to give authenticity and reflect the historical period of the project. In addition, the double headed eagle appears to be looking at the two columns of icons on the screen directing the user to the icons.
In the *Music Room* the font of the titles have a frontier look giving an air to the period. This screen is simpler than the *Main Menu* and the *Map Room*, in that the two columns are centered in the middle of the screen and there is no background art. This is because there are more information to grasp. The screen, therefore, should be visually easier to understand helping the visual learners.

The *Map Room* also has two columns, but they are designed on a slant to compliment the geography of the Pacific Ocean and North America. All of the icon map buttons go to lessons and are also linked back to the *Map Room*. These menu screens are like terminals giving users choices in their learning paths.

(2) Design of lesson screens provide structure to the content of CRCH. These screens do not have scrollable text. The points at the beginning of each lesson are uniform in that they state three objectives. The screen sizes are also uniform, as well as the fonts. The objectives at the beginning are directly related to the questions at the end and give purpose to each screen. In addition, color combinations are complimentary but not the same. When learners are toggling back and forth within a lesson they see differences in the color design of backgrounds and fonts. This alerts them to know where they are in the lesson.
The differences in the three lesson screen designs are found in the background art. Lesson one's background is the North Pacific which compliments the topic in the text. Lesson two's background features North America, which is the general topic of discussion there. And Lesson three focuses on the Russian colonies. The background screen is a full color drawing of Fort Ross.

In this way, the background screens provide visual motifs that give continuity to the content of each lesson. The lesson screens are arranged and designed to show a rich variety of artwork, much of which is historical in nature. This was done to reinforce the period studied and give authenticity to the project.

(3) The dimensions of the pop-up scrollable text changes from screen to screen to give variety to the different environments. Even color combinations for boarders and backgrounds were chosen to compliment artwork and text. Using design principles discussed above, learning is reinforced with the use of variety, appropriate motifs, and ambience that directly relate to content.

Instructional Design

Colonial Russia in California History was developed to reinforce the linguistic, auditory, and visual learning styles. To this end multimedia
elements were employed. In addition to text, the program includes high quality artwork and graphics. These graphics are essential in the conveying of ideas in the project. Artwork is also used for decoding purposes, helping the visual learner to draw relationships between text and graphics. Also, navigating through the icons is useful in helping the visual learners gain ownership of the program.

Other multimedia elements included in CRCH are music and sounds. Not only is music and sounds used throughout the lessons to establish and reinforce ambience, but an entire music database was developed to give the learner a sampling of songs from the cultures represented. These embedded sound elements reinforce the auditory learner’s quest for knowledge and understanding within a rich media environment.

CRCH is interactive and allows users to control what they are learning. Because of the hyperlinking options available, the learner can control the amount of information being presented. They can delve into sections at various times and revisit them at their own discretion. Sound can be controlled with the click of a button. In addition, the speed of scrollable text can be controlled to suit individual reading styles. If they wish they can go through the entire program without seeing any text at all. This is useful when searching for visual information such as maps or charts.
CRCH also has features that allow learners to select their own learning paths. As stated above, the inherent hyperlinking capabilities allow the learner to go virtually anywhere in the program, exploring what they want and when. The program does not put constraints on the user to read the objectives and answer the questions at the beginning and end of each lesson. One the contrary, databases can be explored for their own right and learners need not confine themselves to a strictly chronological approach to the tutorial.

CRCH was designed not only to make learning fun but also make it relevant in an increasing multicultural society. Information is organized in a number of different ways. The Main Menu is organized to show the difference between the lessons and the databases. The five databases all have their own collections of media and materials, often with direct links to lessons. If the databases are studied first, the user will not be confused, but rather enriched. When they begin the lessons they will, then, have background knowledge to draw from.

The databases help the learner gain important facts from which to build understanding, thus allowing them to begin to analyze the information. When the databases and lessons are fully applied, the learner is expected to be able to conceptualize cause and effect relationships of characters and events, project
alternative scenarios or outcomes, and by doing, be able to develop thinking strategies of their own, ultimately understanding their own thinking processes.

**Formative Evaluation**

To assess the effectiveness of Colonial Russia in California History, a copy of the project was installed on a computer at Vista del Monte Elementary School (Palm Springs, CA). The formative evaluation process was carried out with the approval of the IRB Board of California State University, San Bernardino (See Appendix D). Five teachers and one principal agreed to participate in the evaluation. Since the project addresses California fourth grade History/Social Science, all fourth grade teachers were asked and they consented to be part of the assessment.

The evaluators have different computing backgrounds. None of the participants were novice computer users. One teacher serves as a board member with the local Computer Using Educators (CUE) affiliate. She is also the lead teacher of the school's technology committee. Another teacher has served as an evaluator to other school districts for the Program Quality Review (PQR). The principal is pursuing his Doctorate in Instructional Technology and is a board member of CUE.

The evaluators were told what room the program would be in and were encouraged to drop by when their
schedule permitted. A two week period was allotted to examine CRCH. Each examiner was given two copies of the Consent Form (See Appendix E). They were asked to read then sign the documents. One copy was retained for the investigator and one copy was given to the educators for their personal files. Next, the evaluators were given a copy of the "Formative Evaluation Sheet" (See Appendix F), and asked to read the content to prepare for viewing the program.

After judging CRCH, the evaluators completed the forms and were asked if there were any other comments not mentioned on the sheets. Those communications were also noted by the investigator. They were finally thanked for their input towards the formative evaluation process.

Written and oral feedback were very useful. All of the teachers agreed that CRCH is a useful tool for the fourth grade History/Social Science curriculum and they would like to use the program in their classrooms. All evaluators agreed that this type of program is appropriate and timely in today's multicultural classrooms and that the media employed has instructional value that address various learning modalities.

They agreed that learning objectives were clearly stated and that lesson questions and activities match the objectives. In addition, feedback indicated that screen space was well designed and efficient.
Furthermore, all agreed that artwork, graphics, video, sound, and music were appropriate to student learning. Teachers agreed that the information was grade level appropriate and navigation of the program was understandable and easy to use. Data also revealed that only minimum computer knowledge was necessary to operate CRCH.

However, Colonial Russia in California History was not without glitches and defects. There were problems with text, video, blinking cursors, and different font type styles showing up on host computers. In addition, it was noted that a READ ME folder would be useful for orientation purposes.

Most of the text concerns were grammar omissions and spelling errors. These were easily remedied. Other text concerns related to black text on dark gray backgrounds. Changing text to a complimentary color separates it from the background and causes it to be seen more clearly. All of the quicktime video clips worked as intended but it was noted that the editing of the clips could be neater. Cursors stopped blinking when text was "locked" using the text menu options window. This way text could not be changed.

Also, originally designated fonts were found to be different when played on host computers. To correct this, all text fields were changed to painted text, thus making them permanent along with the background art.
In addition, a READ ME folder was included to orient the user as to the many options and ways to use CRCH. Guidelines on how to respond to the objectives and questions were added as well.

**Strengths, Limitations, and Recommendations**

CRCH is: interactive, self-paced, student-controlled, and supports various learning styles.

CRCH is interactive because students, at any time, can determine the direction of their learning paths. This ability to hyperlink from lesson to lesson and database to database gives the students freedom to explore or review media.

Being self-paced allows the learners to peruse at their own pace or quickly scan for needed information. As stated in the research from chapter two, learners like programs to be student-controlled. They like to assume ownership and have the ability to navigate at their own discretion.

Perhaps the most promising feature of CRCH is its capacity to support the need of several learning styles. The linguistic learner will have no trouble with the numerous text fields, large font size, variety of text, and scrollable text. The visual learner will be delighted with the rich colors, portraits, charts, maps, sketches, and paintings. In addition, the hide/show feature of text fields gives visual learners the option to draw relationships.
between text and background artwork. Auditory learning styles are reinforced with the many sound and music selections embedded within a music database and lessons.

Despite its many advantages, CRCH has limitations. Even though it addresses several learning styles, it does not accommodate all of them. The audio learner would be supported by an optional narration that could be synchronized with highlighted text. Student would see the text as it was spoken. This technique would also help in the English as a Second Language (ESL) classroom, thus making CRCH useful as a reading program. Another shortcoming is the limited curriculum materials about the Kashaya Pomo Indians. Granted, the program's focus is on Russian involvement in California history, but more multimedia materials could be developed about the Pomos.

Recommendations for the future include making CRCH available in several languages. This would fully realize the multicultural theme. The project could be expanded to include many more aspects of early California history, including the hide and tallow trade, colorful characters of the era, and in-depth treatment of other peoples and nations. Primary sources could be made available in the form of ship's logs, documented business transactions, diaries, letters, scientific, and government records of the
period. These kinds of sources and realia would require cooperation with international organizations and governments which, in turn, would greatly enrich content and enhance student outcomes.
Dear Mr. Martisius:

Thank you for your interest in our Galaxy of Home Office Help Clipart product.

You can use our Clipart, royalty exempt, for any non-commercial, i.e., non-profit, application. You can also use our Clipart in any commercial, i.e. for profit, application where the images are only an incidental part of the product offered for sale, as in a Newsletter. Conversely, you cannot use our Clipart for a commercial application where the image(s) would constitute a substantial part of the value of the product being sold. Examples of this would be Posters, T-shirts, or a re-assembly of the images into another Clipart software program. All such intended uses would be defined as a Commercial use of the image for profit, and could not be undertaken without prior approval and arrangement with RomTech, Inc.

Since your product is non-commercial, it is exempt under our interpretation. Your attribution is, however, appreciated and proper under the circumstances. Something like "Clipart courtesy of RomTech, Inc." etc etc would be appropriate. Obviously, should this endeavor later turn commercial in some way, shape, or form, a negotiated arrangement would have to be made between you and RomTech, Inc.

If we can be of any further assistance, please give us a call at (215) 750-6606.

Sincerely Yours,

Patrick E. Fairbairn
Manager - Customer Support
February 12, 1998

Bill Martisius
Vista del Monte Elementary School
2744 N. Via Miraleste
Palm Springs, CA 92262-2299

Thank you for your phone calls and letter. We are happy to grant permission to use some of our published and recorded materials in your Masters project and in your classroom. Please provide the following credit:

Pomo Grass Game Song, El Cantico del Alba, Cielito Lindo, Kalinka, Beryozonka and John Kanaka are reprinted from *They Came Singing: Songs from California's History*, by Arlen, Batt, Benson, and Kester. © 1995, Calicanto Associates, 6416 Valley View Road

Oakland, CA 94611, (510) 339-2081.

Good luck with your project.

Sincerely yours,

Mary Ann Benson
for Calicanto Associates
APPENDIX C


Bill Martisius
502 Calle Abronia
Palm Springs, CA 92262

May 17, 1998

Dear Bill,

I, Daniel F. Murley, State Park Ranger, give full permission to use me as a talent source in the MA project of Bill Martisius for California State University, San Bernadino.

I understand that this project is not for profit and is developed for educational purposes.

Sincerely,

[Signature]

Daniel F. Murley
State Park Ranger
Fort Ross State Historic Park
April 28, 1998

William Martisius

cc: Dr. Rowena Santiago, Science, Mathematics and Technology Education

San Bernardino, California 92407

5500 University Parkway

Department of Science, Mathematics and Technology Education

Dr. Rowena Santiago

Letter of Approval

CSUSB Institutional Review Board (IRB) Approval

APPENDIX D
Evaluator's Consent Form.

CONSENT FORM

I, ______________________, agree to participate in the evaluation of the computer-based program entitled "Colonial Russia in California History": A multimedia tutorial of California History which is being conducted by William E. Martisius. I understand that this participation is entirely voluntary; I can withdraw my consent at any time without penalty and have the results of the participation, to the extent that it can be identified as mine, returned to me, removed from the records, or destroyed.

The following has been explained to me:

1. The reason for the research is to evaluate the effectiveness of the program "Colonial Russia in California History." The benefit I may expect from participating is that I may learn more about this part of the California fourth grade curriculum.

2. The procedure I will be involved in includes working through the program, answering written and oral questions about the effectiveness of the program, and suggesting improvements.

3. This participation will involve no risks of any kind.

4. The results of this participation will remain confidential, and will not be released in any individually identifiable form without my prior consent, unless required by law. The only personal information I need to supply the investigator is my current teaching position or age. Any other information will be given on a voluntary basis.

5. The investigator will answer any further questions about the study either now, or during the course of the investigation.

Signature of Participant ______________________ Signature of Investigator ______________________

Date: __/___/____

PLEASE SIGN BOTH COPIES OF THIS FORM. KEEP ONE, AND RETURN THE OTHER TO THE INVESTIGATOR.
# APPENDIX F

**Evaluation Form.**

**Formative Evaluation**

"Colonial Russia in California History";

<table>
<thead>
<tr>
<th>PLEASE CIRCLE THE APPROPRIATE NUMBER</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning objectives are clearly stated.</td>
<td>1  2  3  4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson questions and activities match the learning objectives.</td>
<td>1  2  3  4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The content is meaningful and useful to California's multicultural classrooms.</td>
<td>1  2  3  4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The use of screen space is well designed and efficient.</td>
<td>1  2  3  4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lessons are consistent in format and structure.</td>
<td>1  2  3  4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Navigation of the program is understandable and easy to use.</td>
<td>1  2  3  4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of artwork, graphics, video, sounds, and music are appropriate to student learning.</td>
<td>1  2  3  4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information is easy to read and understand.</td>
<td>1  2  3  4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum computer knowledge is needed to run the program.</td>
<td>1  2  3  4</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>The program is free of defects.</td>
<td>1  2  3  4</td>
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</tbody>
</table>

**Comments and suggestions:**

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

79
Flow Chart of CRCH.

Flow Chart
Colonial Russia
in
California History

APPENDIX G

Enter Program

Title

Music Room

Credits

Lesson 1

Main Menu

Pomo Info

Lesson 2

Map Room

Lesson 3

Timeline

Intermediate Exit Screen

Video Clips

Exit Program

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Bibliography


