Presents

Mini-Research Models
--Prevent Plagiarism--
Develop Critical Thinking

Mini-Research Increases Student Achievement and Supports the 21st Century Librarian

INCLUDES:

- LM_Net commentary on preventing of plagiarism vs. detection and punishment strategies
- The Challenge to Librarians of the Pew and N2H2 Study of student Internet use
- Doug Johnson strategies for Low Probability of Plagiarism (LPP)
- Mini-Research models and strategies curb plagiarism and develop writing and critical thinking
- Scientific-based research supports the use of mini-research activities to increase student achievement

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Selected LM_Net Listserv Quotes on Preventing Plagiarism

The following quotes were selected from responses to the issue of plagiarism on the LM_Net librarian listserv. These responses emphasize prevention and reform as an alternative to after-the-fact Internet-based forensic solutions such as www.turnitin.com.

The prevention philosophy embodied in these comments also promotes richer and more meaningful research activities that result in increased student achievement in reading, writing, and critical thinking. ProQuest mini-research strategies and models integrate the prevention philosophy and scientific-based research of the learning process expressed by these librarians. More important, they enable teachers and students to use the power of technology combined with the natural curiosity of students to make research activities easier, engaging, and more effective as learning activities.

Implementing the prevention philosophy is an opportunity for librarians to help teachers to transition from plagiarism susceptible topics and then to create new and more meaningful topics that require original thought. These topics should be less scholarly and more engaging to students if there purpose is to increase student achievement. Teachers will also need training and models for managing this new mini-research process and librarians can use ProQuest resources to provide:

1. models that integrate technology effectively from searching to the finished report
2. rubrics-based evaluation models that focus on the research process, writing, and critical thinking
3. relevant resources collections that save teachers and students valuable class time in searching
4. Lexile reading level support in searching for materials appropriate for all student reading levels

Selected and Summarized LM Net Postings

I think there are some important pieces of education/learning that are often missed during early teaching of research skills. Part is the 'on the shoulders of giants' concept that we do build, or at least work, from others' work. Part is that almost any writing will have some inherent POV or bias and that part of the research process is to compare works to determine what those are.

Part is that the research/writing cycle isn't a test of what you've learned, but is putting the student in charge and making them construct their own learning. And yes, sometimes we may, as librarians charged with the responsibility and trained in the skills needed, need to do some education about how that is taught. True story; Yesterday, during a 6th grade note-taking class, I pointed out that having one finger on the paragraph in the encyclopedia and rewriting the paragraph into the report while just changing a few words is basically the same as copying. Hand came up, kid says her teacher last year said that was OK. And other students had heard the same thing.....

It seems to me that if assignments were developed around "big" questions to be asked, such as "What examples of Ancient Egyptian influence do we find in modern society? What rationale can you give for these influences lasting to modern times?" Questions such as this require students to do research, but
there is no way they can plagiarize in their responding report/paper/thesis....so I feel the way to help avoid plagiarism is to work with classroom teachers BEFORE they make the assignment, encouraging higher order thinking research and response.

But perhaps there is some place for debating why students find it necessary to plagiarize - that all-important grade/ score/ mark that seems to be the only outcome of learning that is valued.

While Jamie McKenzie, and many others, urge us that the "answer is in the question" - maybe we need to examine the fundamentals of setting assignments. What are the lifelong learnings that we want our students to take away from having done a particular piece of work? Should there be more than a letter or a numeral on a report card?

The reality, though, is that not everyone is yet in a position to be able to collaborate with each teacher before assignments are set (from what I have read and know, some teachers trot out the same old, same old each year and would not be even willing to listen to suggestions for making it better.) I can remember during library-school visiting a private school library where the librarian had the 'power' to have all assignments sent to her two weeks before they were set so she could vet them for resources, suitability and so forth and change them if required. Not submitted? Not resourced! And the teacher got a blast and a half!

I believe we need to create a mindset that has teachers asking themselves "What lifelong learnings, skills, values, attitudes do I want my students to acquire by completing this task" before they set the task, (and making this explicit to the students) and students understanding that there is more in it for them than a grade on a piece of paper. We need to change the focus from the PRODUCT to the PROCESS and from a content-based curriculum to an outcomes-based one. We need to look at and articulate what our students can do rather than what they can remember.

I have also given workshops entitled A is for Awful : F is for Fantastic to show how meaningless a grade is if the person using it to make judgements has no access to the learning that went with it. The growing use of rubrics is changing things, so maybe there is a place for us to help teachers develop these too. The site that I suggest people start with for these is http://rubistar.4teachers.org/index.php It's free and you can either use those that are already created or customize them to meet your needs.

Plagiarism is a major theme at our high school this year to the extent that every student (and their parents) had to sign an academic honesty code with clear examples of plagiarism and the possible consequences. I've been having all of the English classes come into the library for a "mock trial," in which they debate the guilt/innocence of various "defendants." The guilt offenses range from paraphrasing too closely to direct copying. The exercise is effective in getting students to think directly about what is and what isn't plagiarism, and helps to foster discussion. We also discuss ways to avoid plagiarism, and why it's wrong.

The plagiarism and No Child Left Behind discussions have been wonderfully stimulating. Just reading the education articles in the New York Times each week, you see how the whole NCLB system is having interesting and unexpected effects on even top-rated schools. If one group in the school tests badly, then the whole school is rated unacceptable. It's pretty scary to see, especially since there don't seem to be too many resources forthcoming to help such schools.
Re plagiarism: I recently pulled out my copy of Doug Johnson's new book, Learning Right from Wrong in the Digital Age: An Ethics Guide for Parents, Teachers, Librarians, and Others Who Care About Computer-Using Young People (Linworth, 03). (WHEW! That's a LONG title to type. After reading Doug's recent posts, I re-opened the book this morning and re-read chunks of it, and I so admire the way he's structured it, with real-life scenarios and discussions on privacy, property, appropriate use of technology, and ethical behaviors. He's covered so many bases, and includes loads of references & resources.

Before computers, wasn't copying out of books not allowed? Or is it just that technology has made copying easier?

I would just like to suggest that the real issue is in the nature of the assignments being made. If the assignment facilitates regurgitation and does not require interpretation of the information gathered then that is what the finished product will reflect. If the student is asked to "do a report on a capitol city" they will go to a web page and copy and paste what they find. If on the other hand the assignment asks the student to identify shared common attributes of capitol cities they can not just go to one cite and copy and paste. They have to interact with the information in a more meaningful way, generating their own understanding.

It seems to me what needs to change is the nature of the assignments being made. If the assignment asks the student to interact with the information in some way, to identify a relationship or pattern, draw a conclusion, make a generalization, inference or prediction, etc. rather than just collect it and give it back a lot of the problems would disappear because there would not be a resource from which to copy and paste. Students would have to do some thinking of their own and generate the content of the final product.

Moving in this direction requires changes in the mindset of current classroom teachers as well as methods teachers responsible for training future teachers. Not an easy task but a necessary one.

I don't think using, and even teaching, cut 'n paste is a direct lead to plagiarism. It can be taught as an organizational tool and as a /21st century version of the dreaded 3x5. C’n P notes and cites stored by Topic or by date. And ready to incorporate into a working draft. A small, but practical, advantage is being able to print out the notes file to hand in before draft. A lot easier for the teacher handle than bundles of 3x5s and no rubber bands to break (or shoot). And if it is 'handed in' in files, the cites can hot-link to the original material. It would be pretty easy to note where quotes material isn't noted as a quote.

While you certainly can rip an entire song or CD, you can also take a 30 sec clip for a powerpoint presentation. It is just teaching the tools and techniques needed. Students should be adept at c ’n p as an editing and organizing tool. Especially as more research is on-line (with databases, encyclopedias, and on-line texts) it makes sense to teach the full capabilities of the medium.

Then we took passages from books practiced plagiarizing them by directly copying the words and ideas. Next we tried rephrasing them in an acceptable way, and finally we quoted/cited them properly both within our sentence structure or in footnotes. The students actually enjoyed this exercise, especially
When I gave them rather gruesome or whacky original passages, students told me no one had ever gone over the concept in such detail with them, and they didn't think some teachers really cared.

I applaud Sonya's efforts. However, I really think that there are many teachers who are using pre-Internet skills to teach research skills. Couple that with the instructors who teach kids to "cut and paste" in an effort to save time and of course, paper. The result for many students can only be to do the easy thing and plagiarize.

I'm new to LM and new to school librarianship, but I wanted to share my thoughts on the plagiarism thread. I thank Doug for sharing the line from Brad Hokanson, "The principal sin of plagiarism is not ethical, but cognitive." It holds true for me.

Yes plagiarism is theft and wrong is wrong. But yes there are circumstances where the less-than-holy may well be tempted to take a short cut to meet a need that is not critical to their lives. We are all guilty of "white lies". But perhaps there is some place for debating why students find it necessary to plagiarize - that all-important grade/score/mark that seems to be the only outcome of learning that is valued.

I have watched students whose teacher assigns many research papers/projects and books the computer lab and library computers (but not the "library per se") many times find web sites and cut-and-paste the information into a Word document, probably without the web citation. They were taught to cut-and-paste to cut down on the pages and pages that they were printing from the web. (They would just hit print for all sites they visited and printed 60 pages for one quotation.) This social studies teacher used to do very little face-to-face teaching and took her students to the lab just about every week for "research."

So I come home Thursday night at 7, tired from a rugged practice, and I've got about 4 hours before I need to crash. I have some choices what to do this evening: - spend all four hours researching and paraphrasing to write a paper assigned by Mr. Fuddy-Duddy on the causes of the Crimean War which I know will never get out of Bloom's Taxonomy Skills basement, but technically isn't plagiarism, and about which I could not possibly care less. (Wasn't this like way back with Vietnam and Desert Storm?) - work on the more meaningful assignments in my other 5 classes.
- help my little brother with his science project.
- fill in at work for my best friend who needs the night off.

My choice _might_ be to take a "short cut" on the Crimean War paper which would allow me to do some things which DO have meaning and value to myself and others. The "ethical choice" here is debatable in this rather silly and exaggerated scenario, but I think it one a lot of our students face every day. My dad used to say, "A thing not worth doing, is not worth doing well." And while I do believe cheating and plagiarism are wrong, I also believe there are cases in which it is understandable.

If it is of interest, I have a pre-publication draft of an article that is supposed to be appearing in Phi Delta Kappan sometime this year available at http://www.doug-johnson.com/dougwri/LPP.html that offers 16 ways to design research projects that discourage plagiarism. It puts Edmunson's ideas into realistic practice.
There are NO magic bullets that I’ve found in education - period. But there are strategies that we should exercise more fully. I hope the **methods that result in eliminating the cognitive sin of plagiarism are given at least as much attention as strategies that address its ethical sin**.

However, if her Library Media Specialist had had a conversation or, better, in-service with the faculty about how to design projects with less chance of plagiarism opportunities, perhaps Mr. Fuddy-Duddy would have been less likely to have given that assignment.

I don't think 'cut-and-paste' is really contributing to making plagiarism culturally acceptable. In a copying sense it is faster than the old way of retyping or handwriting from the encyclopedia article, but the big piece is deciding to do that sort of action in the first place. That is, of course, assuming that a decision to copy involves thinking about the choice being made... That would be where developing an academic culture advocating fair and honest use of resources and developing research activities that focus on building skills and involving transformative thinking fits.

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**Strategies for Creating Low Probability of Plagiarism Research Activities**

The following ideas and concepts are summarized from articles posted on Doug Johnson’s web site [www.doug-johnson.com](http://www.doug-johnson.com) and from the article cited below. They are listed to provide teachers and librarians with **strategies for creating a new breed of research projects** that deliver real learning to students and have a low probability of plagiarism. Plagiarism creates many problems for teachers and librarians and obviously does not contribute to student learning. By integrating some of the ideas listed, their energies will be invested in learning and student enthusiasm for research, rather than in detection work and confrontation that aggravates administrators, parents, and students alike.

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LPP projects have **clarity of purpose and expectations**. As an example, Science Fair students undertake **projects worth doing, not just busy work**. An understanding of the scientific method on how to form a hypothesis and how to collect supporting data through experimentation and research is clearly stated as the purpose for Science Fair projects. These projects teach **life-long and usable set of skills**.

LPP research projects **give students choices**. Now here is the important concept: If the purpose of the assignment is to teach the scientific method, **it doesn’t make any difference what the topic is**! Dig down and look at the core concepts your research assignments are trying to teach, and **let the students pick a specific subject that interests them**.

LPP projects are **relevant to the student’s life**. For today’s students, World War Two and the Trojan War both just seem “a long time ago.” So many times we ask our students to research important topics – environmental issues, historical issues, health issues - **but fail to help them make the vital connection of why the findings are important to themselves or the people in town in which they live**. The delightful “I-Search” techniques used by Macrorie (1998), Duncan and Lockhart (2000) suggest that “the topic should choose you.”
LPP projects ask students to write in a narrative (or persuasive: why, why not, how, what if) rather than an expository style (who, what, when, where).

LPP projects stress higher level thinking skills and creativity. Think how different the results of a science project are than a paper that simply asks an “about” question. Hey, Mike, write a research paper about ice. Boring! Instead brainstorm an original theory, design a means of testing it, and find ways to effectively communicate your findings. Suddenly we’ve moved up on Bloom’s taxonomy from the knowledge and inference levels right to application, analysis, synthesis, and evaluation. More fun and impossible to copy.

LPP projects answer real questions. Unfortunately, teachers rarely ask questions to which they do not believe they know the answer. Sort of sad, really. Diminishing to the student; boring for the teacher. Projects should be worth doing, not just busy work.

LPP projects involve a variety of information finding activities. As library media specialists, teachers and parents, we are comfortable with our familiar old primary sources of reference books, magazine indexes, and trade books. Yet the answers to many personal, local, and timely questions cannot be found in them. They can provide excellent background information, but often we need to talk to experts, conduct surveys, design experiments, or look at other kinds of primary and secondary sources (from the Internet and educational databases) to get precise information that is meaningful to the individual.

LPP projects tend to be hands-on. Students are learning by doing, not just listening. Notice too, how many corollary skills may be practiced in engaging “research” projects: writing skills, interviewing skills, photography skills, layout and design skills, speaking skills, (technology skills and the interpersonal skills of collaboration).

LPP projects use technology to spur creativity. Whether for planning, for research, or for communication, many students find the use of technology motivating. The challenge of designing containers that make good productivity tools like graphic programs, desktop publishers, and web page construction kits virtually the antithesis of copying another’s work.

LPP projects use formats that use multiple senses. Scanned artifacts like ration coupons, medals, and old photographs stimulated those students who may not be verbal learners. Our ability to digitize and present information is no longer restricted to the written word but now can include drawings, photos, sounds, music, animations and even movies. All are formats that carry important and often unique information.

LPP projects are often collaborative and produce results that are better than individual work. Joint problem solving, assigning and accepting responsibility, and discovering and honoring individual talents helps create a synergy that results in better, more satisfying projects than students working alone could produce. Not every project needs to be a joint effort, but real-world work environments increasingly stress teamwork. Teamwork in school is not only more enjoyable, but leads to the application of practical interpersonal skills as well – and a reduced chance of plagiarism!
LPP projects have results that are shared with people who care and respond. These kinds of activities (any audience beyond the teacher) are common in scouting, athletics, dramatics, 4-H, and music organizations. Knowing others will be looking and may detect plagiarism helps reduce its likelihood (and motivates extra-effort).

LPP projects are authentically assessed. Quality indicators like rubrics and checklists that are given to students when an assignment is made can help guide learning and keep guesswork to a minimum. As students become more sophisticated in the research process, they should be expected to choose or design their own “rules of quality,” one of the indicators of a genuinely intrinsically motivated person.

LPP projects are encouraged by adults who believe that given enough time, resources, and motivation, all students are capable of original work. Research and real-life success stories have shown that it’s not just the talented and gifted student who can make choices, solve problems creatively, and complete complex tasks.

Another great source of ideas for combating plagiarism in the Internet era is the book written by Lathrop and Foss: Student Cheating and Plagiarism in the Internet Age: A Wake Up Call. Englewood, CO: Libraries Unlimited, Inc. 2000

Judging the Level of Critical Thinking and the Learning Value of Research Activities

Level One: My research is about a broad topic. I can complete the assignment by using a general reference source such as an encyclopedia. I have no personal questions about the topic.

Example: My research is about an animal.

Level Two: My research answers a question that helps me narrow the focus of my search. This question may mean that I need to go to various sources to gather enough information to get a reliable answer. The conclusion of the research will ask me to give a supported answer to the question.

Example: What methods has my animal developed to help it survive?

Level Three: My research answers a question of personal relevance. To answer this question I may need to consult not just secondary sources such as magazines, newspapers, books or the Internet, but use primary sources of information such as original surveys, interviews, or source documents.

Example: What animal would be best for my family to adopt as a pet and why?

Level Four: My research answers a personal question about the topic, and contains information that may be of use to decision-makers as they make policy or distribute funds. The result of my research is a well-supported conclusion that contains a call for action on the part of an organization or government body. There will be a plan to distribute this information.

Example: How can our school help stop the growth in unwanted and abandoned animals in our community?
ProQuest Mini-Research Strategies and Higher-Order Thinking Skills

Information becomes KNOWLEDGE only when it is used to make comparisons, predict consequences, evaluate effectiveness, form connections, and then is communicated to an audience with a purpose.

Tailoring Mini-Research Strategies To Meet the Needs of Your Students

A single research topic can provide a range of mini-research activities that can be tailored to the learning levels of students. The same basket of resources retrieved from a single search can be used to answer a variety of research problems and issues. These strategies are derived from the scientific-based research of Benjamin Bloom and Bloom’s Taxonomy that demonstrates that permanent learning only takes place when students engage higher-order thinking (HOTS) during their school activities.

TOPIC: GLOBAL WARMING
KEY WORD SEARCH: causes of global warming
ENGAGING ISSUE: See the list below

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<th>Mini-Research and Engaging Issues Examples</th>
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<td>Expand:</td>
<td>What is global warming? (look up and paraphrase – lowest level)</td>
</tr>
<tr>
<td>Compare/Contrast:</td>
<td>Compare the current weather patterns with past patterns to decide whether or not there really is global warming. (intermediate level critical thinking skills)</td>
</tr>
<tr>
<td>Critique:</td>
<td>What actions by society and/or nature have contributed to global warming?</td>
</tr>
<tr>
<td>Predict:</td>
<td>Predict what will happen in the future if nothing is done to reverse global warming. (higher-level)</td>
</tr>
<tr>
<td>Persuade:</td>
<td>Persuade the U. S. Government to pass laws that would help to reverse global warming.</td>
</tr>
<tr>
<td>Evaluate:</td>
<td>Evaluate the effectiveness of the past actions taken by government and/or business to reduce global warming. (highest level)</td>
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Using the Internet is the norm for today’s youth. A July ‘02 survey by the Pew Internet & American Life Project shows that three in five children under the age of 18—and more than 78% of children between the ages of 12 and 17—go online. Yet, little is known about student use of the Internet for schoolwork or about their attitudes towards the broader learning that can take place online. Nor has there been much exploration of the consequences of those teenage views for educators, policy makers, and parents. Key findings that impact on libraries and librarians include the following:

1. **The Internet as virtual textbook and reference library.** Much like a school-issued textbook or a traditional library, students think of the Internet as the place to find primary and secondary source material for their reports, presentations, and projects.

2. **The Internet as virtual tutor and study shortcut.** Students think of the Internet as one way to receive instruction about material that interests them or about which they are confused. Others view the Internet as a way to complete their schoolwork as quickly and painlessly as possible, with minimal effort and minimal engagement. For some, this includes viewing the Internet as a mechanism to plagiarize material or otherwise cheat.

3. **The Internet as virtual study group.** Students think of the Internet as an important way to collaborate on project work with classmates, study for tests and quizzes, and trade class notes and observations.

Many schools and teachers have not yet recognized—much less responded to the new ways students communicate and access information over the Internet. Students report that there is a substantial disconnect between how they use the Internet for school and how they use the Internet during the school day and under teacher direction. For the most part, students’ educational use of the Internet occurs outside of the school day, outside of the school building, outside the direction of their teachers. While there are a variety of pressures, concerns, and outright challenges in providing Internet access to teachers and students at school, students perceive this disconnect to be the result of several factors:

1. Even inside the most well connected schools, there is wide variation in teacher policies about Internet use by students in and for class. In individual schools, teachers are the ones who choose whether to make assignments that require the use of the Internet by their students, allow the use of the Internet (often as a supplement to other sources and tools), or even forbid its use.

2. While students relate examples of both engaging and poor instructional uses of the Internet assigned by their teachers, students say that the not-so-engaging uses are the more typical of their assignments. Students repeatedly told us that
the quality of their Internet-based assignments was poor and uninspiring. They want to be assigned more—and more engaging—Internet activities that are relevant to their lives. Indeed, many students assert that this would significantly improve their attitude toward school and learning.

Students say they face several roadblocks when it comes to using the Internet at schools. In many cases, these roadblocks discourage them from using the Internet as much, or as creatively, as they would like.

1. Students want better coordination of their out-of-school educational use of the Internet with classroom activities. They argue that this could be the key to leveraging the power of the Internet for learning.

2. Students urge schools to increase significantly the quality of access to the Internet in schools.

3. Students believe that professional development and technical assistance for teachers are crucial for effective integration of the Internet into curricula.

4. Students maintain that schools should place priority on developing programs to teach keyboarding, computer, and Internet literacy skills.

5. Students urge that there should be continued effort to ensure that high-quality online information to complete school assignments be freely available, easily accessible, and age-appropriate—without undue limitation on students’ freedoms.

6. Students think that teachers may be reluctant to assign Internet-based research activities because it would be unfair to students who do not have access at home.

**ProQuest Comment:** As the study indicates, most teachers do not know how to create, manage, structure, and evaluate research, including Internet-based assignments. This is the primary reason that more of and more meaningful assignments are not made. Student use of the Internet is mostly at the lower level of Bloom’s Taxonomy simple because there is little guidance in its use.

Librarians have an opportunity to motivate and train teachers and students in effective ways to access, evaluate, and most importantly, use quality information for decision making and problem solving using higher-order thinking skills. The Internet and library databases create this digital opportunity because quality information is now available at home and at any Internet connected computer, not just the school library. This challenge of teaching and training is a higher calling than collecting and cataloging information for research. ProQuest eLibrary with our new curriculum-based training and resources are prepared to help.
This report presents disturbing implications related to the level of appropriate use of the Internet in schools. N2H2 studied the top 300 sites visited by number of page views and considers this data as being “representative” of typical use.

1. **Instructional – Reference** 17%
2. News and Sports 16%
3. Business and Finance 15%
4. Commerce and E-Services 14%
5. Music, Games and Entertainment 13%
6. **Portals and Search** 13%
7. Communities – Chat and Message Boards 12%

Categories 1 and 6 have the greatest probability of being connected with curriculum and classroom assignments. The other use categories suggest that students were probably **not** accessing information for **curriculum use, but for personal use instead**.

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### Too Often, Educators' Online Links Lead to Nowhere


Education Week -- By Andrew Trotter -- December 4, 2002

Teachers spend all this time book- marking links and they disappear. bigchalk to the rescue. See point 3 below.

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**PROQUEST COMMENT:** This data and similar studies indicate that much valuable classroom and library time for learning is being wasted when surfing the Internet for information. Leading Educators have estimated that the amount of websites on the Internet that contain **curriculum relevant information is about 6-7%**.

1. Haphazard searching for information is not a **standards-based learning activity**. Accessing relevant information quickly and analyzing, synthesizing, and reporting conclusions is standards-based learning.

2. ProQuest’s learning solutions contains nothing but publisher quality information. eLibrary provides 7 media types, simplifying searching and saving time for essential learning.

3. In addition, eLibrary has **160,000 Editor’s Choice websites** that are organized by topic tree categories that **mirror K-12 curriculum subject areas** and are maintained on a regular schedule. Again, no surfing the Internet, but getting to quality sites quickly without a lot of teacher supervision or bookmark building.

4. The BookCart feature in eLibrary provides teachers and librarians a way to **collect standards-aligned** learning resources customized for Lexile reading level and student interest.
### Requirements for Librarians to Create a School Culture that Integrates Mini-Research Activities Across-the-Curriculum

<table>
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<th>Library always open and available when needed by students</th>
<th>Traditional Library</th>
<th>Internet Surfing Alternative</th>
<th>eLibrary +BookCart + Training</th>
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<td>Yes</td>
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<tr>
<th>Library has ample current learning resources for class use</th>
<th>No</th>
<th>Yes</th>
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<tbody>
<tr>
<td>Library has only authoritative and kid-safe learning resources</td>
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<td>No</td>
<td>Yes</td>
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<tr>
<td>Library has ample collection of curriculum-related multimedia</td>
<td>?</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Library has easy access to age-appropriate learning resources</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
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<td>Library has sufficient learning resources for simultaneous use</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Library is organized for easy access to learning resources</td>
<td>?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Librarian creates 100s of customized collections of learning resources for student and teacher use on demand</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Library resources include 7 media types and websites</td>
<td>?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Librarian trains teachers and students in searching</td>
<td>Yes</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Librarian trains students in how to USE information for problem solving and decision making by forming reasoned opinions</td>
<td>?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Librarian trains teachers in how create engaging assignments that integrate critical thinking</td>
<td>?</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Librarian creates resources and models for students and teachers that motivate increased use of research activities</td>
<td>?</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Librarian receives for share in NCLB grants to fund digital learning resources</td>
<td>?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Librarian works with parents to support effective use of the Internet for students at home</td>
<td>?</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Librarian correlates library resources and research activities to state standards</td>
<td>?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Librarian organizes Internet web sites by curriculum area and age appropriateness</td>
<td>?</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The following pages illustrate models of written mini-research reports designed to motivate teachers to assign these achievement-enhancing activities more frequently. The designs leverage the power of word processing to make reports easier to create and to cite. They also integrate the PREVENTION philosophy through the use of a teacher approved summary document model.
SHOULD STEM CELL RESEARCH WITH HUMAN EMBRYOS BE STOPPED?

An Engaging Issues Report by Barbara Student, May 03

STUDENT EXECUTIVE SUMMARY

Stem cell research with human embryos has the potential to develop breakthrough cures for a host of genetic diseases that kill millions of Americans and other people in foreign countries. Stem cells are basic cells that develop first in human embryos after fertilization. All other specialized cells in the human body evolve from stem cells by a process that is not fully understood today. By understanding this process, scientists could grow new organs and other specialized cells to replace damaged or diseased cells in human beings, and thereby prolong and extend the quality of their life.

Why would this research not be acceptable and even be supported by everyone? Those who oppose this research argue that it is immoral to use human embryos because in the research process you are destroying a potential human being. Others who support the research argue that by not engaging in research, we are allowing the destruction of existing human beings.

I support the right to do research on existing embryos and if necessary, to have new sources of voluntary donations to increase the supply. If research in our country is stopped, then it will continue in some other country that may not have the best interests of our citizens in mind.

History has shown that when major scientific discoveries have occurred, they are always challenged by religious groups who predict all sorts of dire consequences for humanity. History has also shown, that when these discoveries are adopted and managed well, human beings have always benefited. Many examples of this are second nature to us now: blood transfusions, organ transplantation, vaccination, etc.

Essential Question 1: What is stem cell research?

Embryonic stem cells are pluripotent, meaning they are capable of developing into any cell type in the human body. Animal research suggests stem cells may some day provide a way to repair or replace diseased tissues and organs and make it possible to treat people with a wide variety of conditions, such as diabetes, Parkinson's disease, and Alzheimer's disease, for which we currently have no cure. Embryonic stem cells are harvested from three sources: aborted fetuses, so-called cadaveric stem cells; embryos left over from in-vitro fertilisation efforts, so-called discarded embryos; and embryos created in the laboratory solely for the purpose of producing stem cells, so-called research embryos.

Essential Question 2: Who Opposes this research and why?

Opposition to the use of embryonic stem cells from any of these sources comes mainly from those who hold that human life begins at conception and that destroying an embryo at any stage of development is tantamount to infanticide.

Some stem cells, however, have also been isolated from adult tissues, and opponents of human embryonic stem-cell research argue that research should be limited to such cells. But the general view of scientists...
working in this area is that adult stem cells, while they may one day prove useful for treatment, are simply not as versatile as their embryonic counterparts, because they are already partly differentiated.

Defending cloning and stem cell research against faith-based curbs; Hull, Richard T; Flynn, Tom; Free Inquiry 01-01-02; Page: 27

The report expressed the concern of conservatives that "society (and not only the embryos) will suffer irreversible moral harm by crossing the boundary that allows nascent human life routinely to be treated as a natural resource." This view turns on seeing embryos at their earliest stages as identical with humans that will, if those embryos are allowed to develop, clearly exist. This key belief, as well as the tactics of some of its proponents, deserves careful investigation. For, if it cannot stand up to nontheistic philosophical analysis, basing governmental policy on it crosses the boundary separating church and state.

Essential Question 3: Who supports this research and why?

Stem-cell research: Drawing the line; Anonymous; The Lancet 07-21-01; Page: 163

Advocates of embryonic stem-cell research hold that while embryos certainly deserve respect they are not yet fully human and that the good that may result from medical research studies with their cells justifies their use.

Defending cloning and stem cell research against faith-based curbs; Hull, Richard T; Flynn, Tom; Free Inquiry 01-01-02; Page: 27

For, if it cannot stand up to nontheistic philosophical analysis, basing governmental policy on it crosses the boundary separating church and state.

In 1997, the Council issued "A Declaration in Defense of Cloning and the Integrity of Scientific Research." Thirty-one leaders in biology, philosophy, ethics, and other fields signed this document, which the defended the inherent moral licitness of biotechnologies including human cloning.

Several G.O.P. Senators Back Money for Stem Cell Research; Pear, Robert; The New York Times; 06-19-01; Page: A.18

Two of the senators, Orrin G. Hatch of Utah and Susan Collins of Maine, said such experiments could be conducted safely and ethically under guidelines adopted by the National Institutes of Health.

Senator Hatch, a foe of abortion, told Mr. Bush that research with embryonic stem cells The president's advisers on science and health policy, including Tommy G. Thompson, the secretary of health and human services, see immense potential value in research with embryonic stem cells. But Karl Rove and other political advisers worry that support for such research would alienate conservative voters, anti-abortion groups and the hierarchy of the Roman Catholic Church.

Ethicist weighs in on stem cell research; Jim Buckell; The Australian; 04-09-03; EDITION: 1

Dr Young said stem cell research was progressing rapidly and if opportunities to extend stem cell lines available for research did not expand in the US, companies such as Genron would consider shifting overseas.

Already it was developing proposals to shift work to Canada, Korea, China or Singapore, where restrictions were not so great.

Cancer, Up Close and Personal; Golden, Carl; The New York Times; 03-30-03; Page: 14NJ.15

I, and others like me, understand the position of those who oppose stem cell research on the ground that it represents destruction of human life. To us, it represents saving lives. We are not eager to engage in an
abstract argument, probably never to be settled, over when life actually begins; many of us are painfully aware of when life actually ends.

---

**Procedures for the Informal Mini-Research Model**

1. Each citation is copied and pasted from the original document in the eLibrary--CE format, avoiding complex style transformations and saving time for writing and critical thinking. These documents can come from independent student searches or from teacher/librarian BookCarts. Formal research citations and bibliographies are best learned when teaching the formal research paper to the appropriate students.

2. Paragraphs of essential information from 3-4 documents are copied and pasted from the original documents and combined with the citation for each. Essential information should addresses any or all the issue’s 3 essential questions.

3. This Summary Document of 3 or 4 citations and essential information demonstrates the student’s critical reading and thinking skills (about 2 pages of information).

4. The teacher evaluates this Summary Document before the written report to determine the relevancy and adequacy of the information gathered by the student and to help the student organize the written report. The teacher initials the summary document to ensure that these will be the resources used to prepare the report.

5. This Summary Document is attached to the final report to serve as an informal bibliography and to help validate that the report represent original thinking and is not plagiarized.

6. Each final report includes an original Executive Summary that states the reasoned opinion of the student, the 3 essential questions, the citation(s) and the supporting evidence from the Summary Document.
SUMMARY DOCUMENT FOR REPORT ON STEM CELL RESEARCH

This Summary Document is used by the student to answer the 3 essential questions about the issue being research and that are the basis of the final report. Citations and the best parts of this document are copied and pasted into the final report based on which parts best address the 3 essential questions.

A copy of this Summary Document is approved by the teacher before the preparation of the final report

The final report requires a Student Executive Summary that expresses the original and reasoned opinion of the student based on the researched information and citations.

eLibrary citation copied, pasted, organized, and underlined: Stem-cell research: Drawing the line; Anonymous; The Lancet 07-21-01; Page: 163

Only relevant parts of the original documents copied and pasted here: Embryonic stem cells are pluripotent, meaning they are capable of developing into any cell type in the human body. Animal research suggests stem cells may some day provide a way to repair or replace diseased tissues and organs and make it possible to treat people with a wide variety of conditions, such as diabetes, Parkinson's disease, and Alzheimer's disease, for which we currently have no cure. But because harvesting human embryonic stem cells requires the destruction of an embryo, a potential human life, such research also raises troubling ethical issues.

Embryonic stem cells are harvested from three sources: aborted fetuses, so-called cadaveric stem cells; embryos left over from in-vitro fertilisation efforts, so-called discarded embryos; and embryos created in the laboratory solely for the purpose of producing stem cells, so-called research embryos. Opposition to the use of embryonic stem cells from any of these sources comes mainly from those who hold that human life begins at conception and that destroying an embryo at any stage of development is tantamount to infanticide. Advocates of embryonic stem-cell research hold that while embryos certainly deserve respect they are not yet fully human and that the good that may result from medical research studies with their cells justifies their use.

Some stem cells, however, have also been isolated from adult tissues, and opponents of human embryonic stem-cell research argue that research should be limited to such cells. But the general view of scientists working in this area is that adult stem cells, while they may one day prove useful for treatment, are simply not as versatile as their embryonic counterparts, because they are already partly differentiated.

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Two of the senators, Orrin G. Hatch of Utah and Susan Collins of Maine, said such experiments could be conducted safely and ethically under guidelines adopted by the National Institutes of Health.
Senator Hatch, a foe of abortion, told Mr. Bush that research with embryonic stem cells was "consistent with bedrock pro-life, pro-family values." The experiments, he said, raised questions "fundamentally different" from those surrounding abortion.

Senator Collins, a supporter of abortion rights, said, "Stem cell research holds tremendous potential to treat and even cure a vast array of diseases and conditions," including diabetes, Alzheimer's disease and spinal cord injuries.

The president's advisers on science and health policy, including Tommy G. Thompson, the secretary of health and human services, see immense potential value in research with embryonic stem cells. But Karl Rove and other political advisers worry that support for such research would alienate conservative voters, anti-abortion groups and the hierarchy of the Roman Catholic Church.

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Already it was developing proposals to shift work to Canada, Korea, China or Singapore, where restrictions were not so great.

Cancer, Up Close and Personal; Golden, Carl; The New York Times; 03-30-03; Page: 14NJ.15

To those who have never been through this experience, research using stem cells of embryos holds out bright promise that they will never have to go through it.

The same holds for those suffering from Alzheimer's disease, diabetes or arthritis, or for those whose lives have been shattered by a spinal cord injury.

It seems such an easy decision to use stem cells from embryos that are destined for destruction in any event to develop potentially life-saving treatments for those suffering from terminal or debilitating illnesses.

I, and others like me, understand the position of those who oppose stem cell research on the ground that it represents destruction of human life. To us, it represents saving lives. We are not eager to engage in an abstract argument, probably never to be settled, over when life actually begins; many of us are painfully aware of when life actually ends.
The Ethical Implications of Genetic Cloning

You can include a graphic image here

UPPER DUBLIN HIGH SCHOOL

Student: Tammy Weisman
Science—Biology II
Teacher: Mr. Carl Janetka
February 24, 2003
The Ethical Implications of Genetic Cloning
By Tammy Weisman

This is a model of the FORMAL report format used for a mini-research report. It summarizes how the cloning of a sheep named Dolly, in Scotland, opens up a new world of ethical controversy as well as wonderful opportunities for mankind. It requires the student to (1) Search eLibrary to get relevant information, (2) browse each article to determine its significance to the mini-research report strategy, (3) save the significant articles, (4) copy and paste citations and significant information to a summary document (which is attached to the written report), and then (5) create a final report, using in-text references, that connect the student’s work to the appropriate eLibrary sources. (Schmickel)

The teacher’s research strategy motivates and focuses the student’s search in eLibrary. The teacher will also have to provide some guidance in searching eLibrary with key words, to get the most relevant information without wasting time. Saving information to disk in a school environment is preferred over printing each article because it saves paper, ink, and time on the front end of research, and then, saves some keying and keying mistakes on the back end, or final report. For schools who have computer lab(s) and/or library computer access for students, saved articles can be browsed in detail, off-line, saving on-line costs, and freeing computers that are on-line for more student research. (Hotz)

From the browsed articles, students will copy and paste citations and significant information to a summary document. The teacher then conferences with the student to create an optional outline, utilizing the strategy (problem) statement and the summary document. The teacher would then have copies of the outline and the summary document to help in evaluating the authenticity and the quality of ideas and writing in the final report/presentation. (Norris)

The finished report could be assigned individually, or to teams of students. The report could also be presented orally (supported by the summary document), or as PowerPoint presentation. Teachers would be responsible for a strategy related to their subject content, the final form of the report, and its evaluation. It is important that reports are brief (150 to 250 words is recommended), and assigned frequently enough so that students learn to master the research process prior to graduation from high school. (Will)
Reports are shown in double spacing so that teachers can utilize this space for comments if they choose to make them. A separate evaluation model with rubrics is included in this guide. Using eLibrary BookCarts provides teachers with the ability to focus student attention on the best resources for learning and to be able to recognize the sources selected for the report on the summary document.

This is a model of a mini-research report of approximately 0 words, using 4 sources, with in-text references, and a summary document attached as the bibliography. This would be appropriate for a high school student. Shorter (100-150 words) with 2 or 3 sources would be more appropriate for middle school students.

If teachers want to use a formal bibliography as an option, then visit www.easybib.com for a free citation maker for a variety of resources both electronic and print. Easybib also allows you to select from a variety of formal styles such as MLA and APA. The caution here is that this step will add time to mini-research and adds no value related to increasing achievement in reading, writing, and critical thinking.
In creating Dolly from a single adult ewe cell, researchers at Scotland’s Roslin Institute crafted the latest living invention to mark the crossroads of science and human values. These experimental creations are more than laboratory curiosities. Indeed, the seeds of the new biology are being sown across millions of farm acres this year, and its fruits are appearing on supermarket shelves and in medicine cabinets in hundreds of thousands of homes. The biological revolution is altering—in ways that we have yet to recognize—our image of ourselves.

For many scientists, cloning offers an unprecedented opportunity to engineer new life forms more efficiently, to revive endangered species and to explore treatments for a host of human diseases. However, critics in the United States and around the world have argued that cloning oversteps the bounds of morality, offering humanity too much power to manipulate living things. And the prospect of cloning human beings, they say, is repugnant.

"I am wondering if it is not time to set some limits on science," said Lori Andrews of Chicago-Kent College of Law at the Illinois Institute of Technology, an authority on genetic engineering and reproductive technologies.

Now, what if the great given—a human being is the product of the union of a man and a woman—is no longer a given? The news from Scotland could have immense consequences for mankind's moral life—for thinking about "ought" propositions.

In his essay "Making Babies: The New Biology and the 'Old' Morality" Kass noted that technological corollaries to the pill—babies without sex—involve not just new ways of beginning life but new ways of understanding and valuing life. Connections with parents, siblings and ancestors are integral to being human, although not to being a sheep. Can individuality, identity and dignity be severed from genetic distinctiveness, and from belief in a person's open future? When Hiroshima occasioned anxious talk about the dangers of physics, Einstein replied that the world was more apt to be destroyed by bad politics than bad physics. Dolly raises the stakes of biology, but also of philosophy.

If the technology to clone developed human beings were to become feasible, would we justify its use? Although cloning involves a replication of genetic material, it does not "duplicate" the person. Environment plays a substantial role in the development of our abilities and personalities. Nevertheless, our genes contribute significantly to our talents, appearance and temperament. Would it be worthwhile for us to clone people with exceptional intelligence or artistic genius? Moreover, as a result of reproductive techniques like in vitro fertilization, many single individuals have already used donor sperm or eggs to pass on their genes.
An ethical response to this latest scientific discovery and its future uses must mediate between two extremes. Some people believe that any dabbling in genetics usurps a role reserved exclusively to God; that is, only God should play God. However, God has endowed human beings with intelligence, ingenuity and creativity for a purpose.

At first glance, sheep cloning offers significant potential benefits. The technology may offer a way to mass-produce drugs to treat diseases at a lower cost. Though other ethical issues are associated with cross-species transplants, cloning experiments may yield genetically engineered animal organs that can be transplanted into humans with less risk of rejection. Better livestock and more efficient food production may also result from Wilmut's discovery. The technology may even offer a way to save endangered species.

Sharon Schmickle; Staff Writer. Cloning controversy // Cloned people? Senate panel tackles debate // The scientist who cloned a sheep and created a debate in the process says there's no reason, Star Tribune

It is recognized as the first clone from a mature mammal cell, something many scientists doubted was possible. The stunning announcement propelled Wilmut into a whirlwind of debate over the practical, legal and ethical implications of cloning. Within 10 days, bills were introduced in Congress to prohibit cloning humans and to outlaw federal funding on research in human cloning.

"Playing God" "Human beings are not God and we should therefore not try to play God," insisted Sen. Christopher Bond, R-Mo., author of one of the bills.

"They accused Galileo of playing God, too," retorted Sen. Tom Harkin, D-Iowa, referring to the 17th-century astronomer who was condemned for heresy for arguing that Earth and the other planets revolve around the sun. "This is a constant, common refrain down through the centuries that somehow we are playing God."

Teacher Conference Approval Signature_______________________________________

Author name is **bolded** to indicate that it will be the reference used in the in-text references in the finished report.

The summary document provides the teacher with evidence that the student has gathered **enough quality information** for the report. Signing the summary document for approval and then receiving it again with the final report, **dramatically reduces PLAGIARISM**.
Mini-research reports **are not term papers**. They need to be relatively easy to evaluate to encourage teachers to make these kinds of valuable assignments. For this reason, this model will focus mostly on the research process (and the inherent critical thinking skills), not solely on the traditional criteria of correctness of the ideas, or the mechanics and format of the content. Critical thinking elements are shown in **bolded text**. Teachers can create their own system, using the model below as a guide, emphasizing the criteria that they feel are most important. But, keep it simple!

<table>
<thead>
<tr>
<th>Possible Evaluative Criteria</th>
<th>Worth</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>The issue/question/problem was developed and stated clearly. <em>(Questioning)</em> OPTIONAL</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brainstorming resulted in providing a series of related key words and phrases to focus the search. <em>(Planning) and (Searching)</em> OPTIONAL</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The information gathered through searching was relevant to the topic/issue. <em>(Analyzing)</em></td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>The outline developed, provided a clear map for creating the first draft. <em>(Organizing)</em> OPTIONAL</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The draft copy followed the outline and needed minimal editing and restructuring. <em>(Synthesizing)</em> OPTIONAL</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The draft copy had conclusion(s) justified by the information gathered in research. <em>(Evaluating)</em> OPTIONAL</td>
<td>30</td>
<td>26</td>
</tr>
<tr>
<td>The final report/presentation included all the required parts and format. <em>(Organizing)</em></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>The final report/presentation was free of major errors in grammar, spelling, and punctuation. <em>(Communicating)</em></td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>The final report used a style that was interesting, and easy to read/understand. <em>(Presenting/Reporting)</em></td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>

**POINTS** 100 86
Advantages of Mini-Research Activities

1. Easier for students to complete and teachers to assign than traditional research papers
2. Mini-research supported by scientific-based research on effective learning activities
3. Can be assigned in any subject area and extends the currency and value of textbooks
4. Shorter Assignment can be more frequent to reinforce technology and information literacy skills and support state standards
5. Mini-research strategies, ideas and models available online for teachers and librarians
6. Mini-research activities are based on Bloom’s Taxonomy and HOTS
7. Summary Document model and method presents ways to help prevent plagiarism
8. Mini-research improves essential reading, writing, and critical thinking skills

Spectrum of Critical Thinking Skills Used in Research Activities

- **Evaluate (Highest Level)**
  - Bloom’s Taxonomy

- **Predict**

- **Persuade**

- **Critique**

- **Compare/Contrast**

- **Print/Paraphrase (Lowest Level)**

- **Traditional Research Strategies for College Prep Students**

- **No Child Left Behind & Critical Thinking**

- **ProQuest Mini-Research for All**

- **State/National Standards**
### Advantages of ProQuest Mini-Research Models and Methods vs. Traditional Term Papers

<table>
<thead>
<tr>
<th>Term Papers</th>
<th>ProQuest Mini-Research Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal—Written</td>
<td>Informal—written, oral, PowerPoint</td>
</tr>
<tr>
<td>Lengthy, Time Consuming and Infrequent</td>
<td>Brief, Several Class Periods, and Frequent</td>
</tr>
<tr>
<td>Traditional and Scholarly Topics</td>
<td>Current, Relevant and Engaging Topics</td>
</tr>
<tr>
<td>Focus on College and College Bound</td>
<td>Focus on All Students and State Standards, Reading and Writing Skills</td>
</tr>
<tr>
<td>Traditional Methods and Formats</td>
<td>Technology Enabled Methods and Formats</td>
</tr>
<tr>
<td>English and Social Studies</td>
<td>All Subjects and All Levels</td>
</tr>
<tr>
<td>Focus on Formats and Citations and</td>
<td>Focus on Critical Thinking, Expression of Reasoned Opinion, and Problem Solving,</td>
</tr>
<tr>
<td>Traditional Topics Prone to Plagiarism</td>
<td>Mini-Research Method and Original Thought Topics Help Prevent Plagiarism</td>
</tr>
<tr>
<td>Focus on Individual Effort, Print Output and</td>
<td>Open to Collaboration with Team Reports, Multimedia and PowerPoint Presentations, Variety of Print Formats and Peer Audience</td>
</tr>
<tr>
<td>Teacher as Audience</td>
<td>Students Encouraged to Use a Variety of Media from Respected Sources</td>
</tr>
<tr>
<td>Students Generally Limited to Local Resources</td>
<td></td>
</tr>
</tbody>
</table>

**PROQUEST COMMENT:** Brain research shows that permanent learning only takes place when research activities are assigned frequently enough that students can exercise and develop the essential skills of critical reading, writing, higher-order thinking, and presenting ideas and opinions with a purpose. Brain research also shows that these activities must be related to student interests about their world and provide the opportunity for them to develop their own “reasoned opinions.” This desired learning is impossible to do for all students when schools depend on the “term paper” as their only research strategy.

The College Board has included a new essay section in the SAT for 2005 to encourage more writing in the curriculum because of the poor writing skills of most college freshmen.

A recent study of Social Studies teachers indicates that the age of the term paper is rapidly disappearing and being replaced by shorter and more frequent types of mini-research. Education Week – November 20, 2002.
Several new initiatives have occurred recently that recognize the renewed importance of writing as an essential activity for student learning. Writing is always a part of every mini-research activity.

- Research shows that the number of writing activities assigned in K-12 classroom has diminished and been replaced by increasing use of multiple choice assessments which require less teacher time and effort to grade.

- Research shows that narrative, expository, and persuasive writing require the use of higher-order thinking skills (HOTS). HOTS are essential for permanent learning vs. rote learning that is primarily temporary.

- Research shows that the most important factor for college success is the ability to write.

To motivate more writing activities across the curriculum because of their value . . . . .

- The 2005 SAT will require writing samples that express student ideas on a variety of issues based on writing deficiencies discovered by an increasingly greater number of high school graduates.

- Colleges have recently put more emphasis on evaluating writing samples in the admissions process.

- The College Board revises the new SAT (05) to include essay writing component to encourage more writing.

- The College Board indicates that strong writing skills are a reliable and essential predictor of college success.

National Commission on Writing in America’s School and Colleges activities in K-12

1. NCW – “Writing is essential to educational and career success”

2. NCW – “Writing allows students to “connect the dots” in their knowledge and is central to self-expression”

3. NCW – “Writing is how we teach students the complex skills of analysis, synthesis, and problem solving”

4. NCW – “Writing must become an important focus beginning with elementary school”

5. NCW – “Assessment with only multiple-choice tests is not adequate”

ProQuest Comment: Every mini-research assignment integrates writing using critical thinking that results in the construction of original thought and reasoned opinion by the student. It stands to reason that the use of technology, the Internet, and library digital learning resources enable mini-research assignments to be more frequent than in the past when quality resources were limited and not as easily accessible.

Librarians can secure their future by embracing the challenge of the Internet and using their expertise to train teachers and students to use this flood of new information effectively. The new emphasis must be more on ways to use information for learning, rather than on searching for information.
The following collection of scientific-based research findings is intended to provide curriculum leaders in public and private K-12 schools with the motivation and evidence to integrate more inquiry-based teaching strategies into the curriculum. These strategies require student to seek and use relevant and authoritative information to solve problems and to make informed decisions based on “reasoned opinion.”

These mini-research activities encourage the use of reading, writing, and critical thinking (state standards and assessment skills) as the tools to explore relevant topics and issues that contribute to better understanding of academic content. The essential higher-order thinking skills developed will serve students well during school, in life, and in future careers.

**These activities are ONLY effective in increasing student achievement when . . .**

1. a variety of learning resources, both print and electronic, are available to students and teachers
2. teachers know how to structure these activities to engage student higher-order thinking skills (HOTS)
3. learning resources are customized to the needs and interests of the learners
4. Librarians are proactive in providing quality learning resources and creating customized collections of resources for teacher and student use

The benefits of inquiry-based learning are many including the lifelong ability of learning how to learn, information literacy, technology literacy, and deeper understanding of academic content. But this summary will focus **only** on the benefits that are currently recognized as **essential skills** and are tested on **state assessments**:

1. Reading, particularly *inferential reading*
2. Expository and persuasive writing
3. Critical thinking and problem solving

Each of the learning-related categories and the scientific research citations listed in this summary are applicable to the **unique content and features of eLibrary** when combined with **teacher training** in the **ProQuest mini-research process**. Working together, this combination of technology, learning resources, and proven pedagogy provides the tools for teachers to customize learning activities by state standards, and student interest and reading level. These are some of the strategies that scientific-based research has demonstrated will **increase student achievement**, especially in the three areas listed above.
Scientific research has identified many learning strategies and activities that help to increase student achievement. One of these is **student research on engaging current issues**. Through technology and the Internet, it is possible for this type of successful traditional learning activity to occur **more frequently** than in the past through “mini-research,” therefore the learning benefits are multiplied. These benefits include the essential skills of **inferential reading, expository and persuasive writing, and critical thinking**. These skills are the heart of **state standards** and the accompanying **state assessments** which **measure student achievement**. eLibrary’s **new training model** helps provide teachers with the strategies, models, content, and tools that make ProQuest mini-research activities generate increased student achievement in essential skills and academic content too.

<table>
<thead>
<tr>
<th>Scientific-Based Research (SBR) Support for Student Research Activities</th>
<th>Teacher + Textbook Learning</th>
<th>Teacher + Textbook+ eLibrary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have daily access to visual, interactive, websites and multimedia content as well as verbal information -- <strong>most learners have a visual learning styles</strong> (5)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Are involved in solving problems relevant to their community and world -- <strong>permanent learning only occurs when information is socially relevant</strong> (1)</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Have daily access to current information in the topic of study -- <strong>learning in context of the learner’s world increases motivation and permanent memory</strong> (1)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Have to defend their opinions on relevant issues with facts -- <strong>information can be constructed into knowledge through engaging inquiry-based activities</strong> (4,2,6 )</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Integrate reading with writing in an activity that focuses on questions of how, why, why not, and what if. -- <strong>higher-order thinking results in greater learning</strong> (2,3)</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Integrate reading and writing in the same activity -- <strong>both reading and writing are learned more effectively when taught together rather than separately</strong> (2,7)</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Present the products of their mini-research and ideas to peers and/or others -- peer review provides the motivation that is essential to learning (1,2)</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Collaborate with others to solve a problem or defend an opinion -- <strong>collaboration and communication provides essential feedback to test ideas and concepts</strong> (3,6)</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Investigate topics in-depth – <strong>in-depth learning provides greater retention of ideas; surface learning of facts is temporary</strong> (1,4)</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Learn by problem solving with a variety of relevant information--application of facts and concepts through activity results in increased learning (6)</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Can easily explore other topics related to the current lesson or theme -- <strong>the brain processes information through patterns and associations</strong> (1,7)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Can learn anytime and anywhere -- <strong>learning is more efficient when students are ready to learn</strong> (7)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Integrate time-saving technology tools into their learning process – <strong>time must be conserved for higher-order thinking by minimizing lower-order tasks</strong> (6,7)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Access customized learning resources at home and at school -- <strong>parent support and always-available and appropriate learning resources increase achievement</strong> (1,7)</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Each **bolded number** refers to the section of the **ProQuest Scientific-Based Research Guide** that summarizes available research that supports the statement shown above. A copy of the guide is available from your ProQuest sales representative.

The formal studies of **library power** from **Colorado**, Pennsylvania, and Oregon prove that proactive librarians and quality library collections (print and digital) do raise student academic achievement. A successful similar study from **Iowa** emphasized **digital library resources** and reached the same conclusions.
| Higher-Order Thinking Level | BLOOM'S TAXONOMY—Bloom, B. S. (1956)  
*Critical Thinking Skills Demonstrated* |
|---------------------------------|-----------------------------------------------------------------------------------|
| KNOWLEDGE                       | **Student Testing**  
* (Lowest Level) |  
- observation and recall of information  
- knowledge of dates, events, places  
- knowledge of major ideas  
- mastery of subject matter  
*Question Cues:* list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc. |
| COMPREHENSION                   |  
- understanding information  
- grasp meaning  
- translate knowledge into new context  
- interpret facts, compare, contrast  
- order, group, infer causes  
- predict consequences  
*Question Cues:* summarize, describe, interpret, contrast, predict, associate, discuss, distinguish, estimate, differentiate, extend |
| APPLICATION                      |  
- use information  
- use methods, concepts, theories in new situations  
- solve problems using required skills or knowledge  
*Question Cues:* apply, demonstrate, calculate, complete, illustrate, solve, examine, modify, relate, classify, experiment, **discover** |
| ANALYSIS                         |  
*Research Activities*  
- seeing patterns  
- organization of parts  
- recognition of hidden meanings  
- identification of components  
*Question Cues:* analyze, separate, order, explain, connect, classify, arrange, divide, **compare**, select, **explain**, infer |
| SYNTHESIS                        |  
*Research Activities*  
- use old ideas to create new ones  
- generalize from given facts  
- relate knowledge from several areas  
- predict, draw conclusions  
*Question Cues:* combine, integrate, modify, rearrange, substitute, create, design, invent, **what if?**, compose, formulate, **generalize** |
| EVALUATION                       |  
*Research Activities*  
* (Highest Level) |  
- compare and discriminate between ideas  
- assess value of theories, presentations  
- make choices based on reasoned argument  
- verify value of evidence  
- recognize subjectivity  
*Question Cues:* assess, decide, rank, grade, test, measure, judge, recommend, explain, **discriminate**, support, conclude, summarize |