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AN EXPERT PANEL REVIEW OF THE QUALITY OF VIRTUAL HIGH SCHOOL COURSES: FINAL REPORT

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SRI Project 7289

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EXECUTIVE SUMMARY

The Virtual High School (VHS) began in 1996, as an innovative consortium developed to provide high-quality Internet-based courses to member high schools throughout the United States. These “netcourses” are taught by teachers from consortium schools and offered to students attending those schools. Hudson School District and the Concord Consortium provide administrative and technical support and management of the program.

To supplement an ongoing evaluation based on surveys and site visits, VHS commissioned SRI to collect data on the quality of a sample of the courses that were taught during the first two years of VHS’s operations. School principals and others at participating VHS schools have reported that they believe the courses to be of high quality. However, a panel of content area experts was established to provide an objective, third-party perspective on the quality of netcourses. The review process and the outcomes reported here may inform and shape the ongoing efforts of VHS to control the quality of its offerings.

The Expert Panel

SRI formed and convened a panel of six subject matter area experts to assist in establishing standards for netcourses and to conduct course reviews. The panel was selected to include members with expertise both in subject disciplines (specifically science/mathematics, English/language arts, or the social sciences) and in standards development. As a group, the panel had extensive secondary-level teaching experience, as well as state and national experience in the development and application of standards for curriculum, instruction, and assessment. (Exhibit S-1 on the next page highlights the relevant expertise of each panel member.)

Developing Standards for Netcourse Quality

The panel was given the tasks of establishing standards of quality for netcourses and utilizing those standards to answer the question that students, parents, teachers, principals, and administrators from other schools or universities might be posing: Are the courses VHS offers of high quality? The expert panel did its work over a period of 5 months.

The group was able to reach consensus during the first meeting on a set of cross-cutting standards of quality for secondary-level courses. For example, panel members agreed that the courses should teach critical-thinking skills, which should be present in each course whether it is a science or language arts course, a one-semester elective, or a year-long Advanced Placement preparation course.

Exhibit S-1
HIGHLIGHTS OF PANEL MEMBERS' EXPERTISE

Steven Meiring	Ohio State Mathematics Supervisor for 25 years; author of addenda supplement to the NCTM mathematics standards; Ohio Statewide Systemic Initiative project
Michael Padilla	Professor at University of Georgia; contributed to national science education standards; principal investigator on Georgia's Statewide Systemic Initiative project
Joanne Grenier	Curriculum Content Specialist in Integrated History/Social Science and English/LA, Massachusetts Dept of Ed; reviews courses for alignment with state standards; helped develop Massachusetts history/social science assessment
Leo West	Past President of Pennsylvania Council for the Social Studies and East Allegheny Education Assoc.; author of AP History software; 24 years as high school social studies chair
Kathleen Fulton	Assoc. Director of Center for Learning and Educational Technology, University of Maryland; works with school districts to implement standards-based curriculum and instruction in English, language arts, and the social studies
Linda Mayfield	Immediate Past President of Virginia Assoc. of Teachers of English; helped develop Virginia's English/Language Arts standards; has taught English courses for 25 years

The panel's standards focus more heavily on content than on instruction. The primary reason for this focus is that quality is to be measured first of all by whether the material being taught is important and well chosen.

The course review rubric adopted by the panel contains an overall course rating (1 to 3). The overall rating is a summary of course quality and is the most critical to the review process. A score of 3 indicates the course is of "high quality"; a score of 2 indicates the course is "satisfactory, but certain questions or issues need to be addressed"; and a score of 1 indicates the course quality is "of serious concern."

The standards document adopted by the panel also contains 19 individual standards, organized into four areas: 8 under Curriculum/Content, 4 under Pedagogy, 5 under Course Design, and 2 under Assessment. Reviewers were asked to rate each individual standard on a scale of 1 to 4. A 1 meant the standard was "not evident" in the course; 2, that the standard was "somewhat evident"; 3, that the standard was "clearly evident"; and 4, that demonstration of this standard was "exemplary."

Besides providing numerical ratings for each of the 19 standards, reviewers were asked to provide written comments about the courses in each of the four general areas (and also in the overall assessment area). Space was provided in the document for commentary as extensive as the reviewers deemed necessary, where specific strengths and weaknesses could be described.

Applying Standards to Netcourses

A dozen VHS courses were selected for the panel to review. The sample of 12 included only courses developed and offered during VHS's first year of implementation (1997-98) that were also taught in later years. This continuity increased the likelihood that the course had the opportunity to be further developed and refined after its initial implementation. Furthermore, the selection of courses focused only on those courses that fell into the core discipline areas: mathematics and science, English/language arts, and the social sciences. From among 18 courses that met these criteria, 12 were selected at random.

Discipline area partners were both assigned the same four courses to review. They were able to review course materials, assignments, students' online responses and discussions, teachers' comments and grades, and other artifacts of the course. Partners were also encouraged to discuss their observations to help resolve any issues or questions that arose.

Outcomes of the Review

At the end of September 1999, SRI collected 24 reviews for the 12 courses (2 reviews for each course) and synthesized the results. Exhibit S-2 shows a tally of overall course ratings.

Exhibit S-2
FREQUENCY OF OVERALL COURSE RATINGS, BY REVIEW AND BY COURSE

<i>Overall Rating</i>	<i>Frequency per Review</i>	<i>Frequency per Course</i>
Of Serious Concern (1)	2	1
Satisfactory Quality (2)	9	4 ½
High Quality (3)	13	6 ½
Total Reviews	24	12

All but one of the 12 courses was rated as satisfactory or better. Six of the 12 were rated as "high quality" (or 3), while another 4 courses were rated as "satisfactory" (or 2). Only one of the 12 courses was rated "of serious concern" (or 1) by reviewers. In addition, there was one instance where reviewers could not agree on the overall rating; one reviewer rated the course "satisfactory" while the other rated it "high quality" (as indicated by a ½ symbol in the exhibit).

"High quality" courses were likely to be consistently excellent and organized throughout most aspects of the course, and usually encompassed some combination of the following: effective and appropriate use of the medium; effective use of teacher's voice within the medium; diverse and multiple methods of instruction; quick, timely, regular feedback; and clear objectives and performance expectations.

One approach used to validate the conclusions reached in the overall ratings is illustrated in Exhibit S-3. The distribution of individual standard ratings across possible options (0-4) shows a strong relationship between the general and specific ratings assigned by the panelists.¹ For example, those courses that were evaluated as high quality were much more likely (62%) to receive exemplary ratings (4) on each individual standard. In addition, high-quality courses did not receive any ratings indicating that a certain standard was “not evident” (1).

Exhibit S-3
PERCENT DISTRIBUTION OF STANDARD RATINGS, BY OVERALL COURSE RATING

<i>Overall Rating*</i>	<i>Individual Standard Ratings</i>				
	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Of Serious Concern (1)	0%	16%	55%	29%	0%
Satisfactory Quality (2)	2%	3%	33%	48%	13%
High Quality (3)	0%	0%	4%	35%	62%
Totals	1%	2%	19%	39%	39%

Individual Standard Ratings: 0 is N/A; 1 is “Not Evident”; 2 is “Somewhat Evident”; 3 is “Clearly Evident”; 4 is “Exemplary”
**Note: Modal responses, by row, are shown in bold.*

Most of the individual ratings on those courses appraised as “satisfactory, with some concerns” were more or less split across the middle of the scale (2s and 3s), with almost half the ratings falling in the “clearly evident” category (3). Ratings for the one course that was assessed as “of serious concern” were clustered in the “somewhat evident” category (2), with no exemplary ratings and several ratings indicating certain standards were not evident.

Ratings by Standard

The vast majority of ratings on individual standards were spread across the “clearly evident” (3) and “exemplary” (4) categories. Review partners, for the most part, gave ratings for each standard within a one-point range. In fact, only about 2% of the 228 possible instances when reviewers could have agreed or disagreed were disagreements in which review partners differed on a rating of a particular standard by more than one point (e.g., one rating the standard a 2 and the other a 4).

Looking across the four categories of standards, courses were more likely to get the highest rating (4) in the area of curriculum and content. (See Exhibit S-4.) In other words, according to the content experts, these netcourses, as a group, facilitate learning of important ideas, concepts, and critical-thinking skills and provide well-balanced and challenging materials.

¹ A score of 0 was also allowed, in case a standard did not seem to apply to the course. Two courses received this rating on the same standard (Standard 8, handling of controversial issues).

Exhibit S-4
PERCENT DISTRIBUTION OF STANDARD RATINGS, BY REVIEW AREA

Area of Rating	0	1	2	3	4	Total # of Ratings
<i>Curriculum/Content</i>	2%	1%	11%	38%	48%	192
<i>Pedagogy</i>	0%	2%	26%	39%	33%	96
<i>Course Design</i>	0%	4%	23%	40%	33%	120
<i>Assessment</i>	0%	6%	27%	44%	23%	48
Frequency Totals	1%	2%	19%	39%	39%	456

Individual Standard Ratings: 0 is N/A; 1 is "Not Evident"; 2 is "Somewhat Evident"; 3 is "Clearly Evident"; 4 is "Exemplary"
**Note: Modal responses, by row, are shown in bold.*

Conclusions

This course quality evaluation process has proven the feasibility of using an expert panel to conduct independent, third-party reviews of VHS courses. A number of other conclusions and recommendations can also be drawn from the process and the work of the panel.

VHS courses provide students with high-quality curriculum content. The quality of VHS courses will greatly influence the success and continued support of the Virtual High School project. This review found that experts rated 11 out of 12 courses at least “satisfactory,” and more than half of the courses reviewed were rated as “high quality.” The expert reviewers rated the area of curriculum content especially high for the large majority of the courses reviewed. These findings indicate that VHS’s emphasis on multiple, interweaving quality control mechanisms is paying off and that students are being offered courses whose content is of high quality.

VHS should continue to focus on curriculum content and on quality control. Although VHS has had impressive results, the single course rated as “of serious concern” raises questions for VHS as the project scales up to offer about 100 courses in 1999-2000 and perhaps 300 courses the following year. The number of courses requiring serious attention to quality could expand in proportion to the total number of courses and might potentially affect dozens of participating schools and hundreds of VHS students. For this reason, it is critical to continue, and even increase, attention to the quality of courses during the development stage. The goal is to be sure that all courses offered by VHS, including those offered for the first time, meet high standards. In addition, using the newly designated faculty advisors, or other disciplinary experts, VHS should continue to review courses even after they are offered. Teachers can be provided with feedback similar to what was provided in the reviews prepared by the expert panel.

The review process worked well, but it is challenging and time-consuming. The review process worked well on many levels. For example, the overall ratings of quality were supported by the

ratings on the 19 individual standards and by reviewers' extensive comments. In addition, there were few conflicts of opinion about the ratings. Still, reviewers also noted that it was difficult, at times, to reduce their judgements to numerical scores; also, differences of opinion about what constitutes quality sometimes surfaced. Importantly, the review process was time-consuming, requiring nearly 2 days per reviewer per course. The time requirements present cost considerations, particularly for the review of the larger numbers of courses expected to be offered by VHS in the future.

The online medium provides a unique evaluative opportunity. Because the Internet allows all interactions to be saved, panelists had the luxury of looking at a class from start to finish, peering in on a single lesson and then following students' and teacher's interactions either backwards or forwards in time. Two days of time reviewing a virtual course is therefore likely to be far more productive than 2 days reviewing a face-to-face course. Because of the opportunities presented by technology, VHS courses may well be more carefully reviewed and evaluated than the typical face-to-face courses offered in high schools.

The review process, including the standards developed by the panel, holds promise in other contexts. During the past decade, a great deal of effort has been expended to develop disciplinary standards for elementary and secondary education. Many fewer attempts have been made to formulate standards that apply across disciplines. The fact that the panel members were able to develop a consensus around standards that are cross-disciplinary is noteworthy. Agencies that grant credit to high school courses (e.g., state education agencies) may find the set of standards developed by the panel to be useful. In addition, other Technology Innovation Challenge Grant projects might be able to apply a similar process, whereby independent experts review course offerings or other products of the grant against a set of quality standards.

The expert panel was impressed with the VHS project. In a separate statement, written by its members (and bound in this report), the panel expressed its enthusiasm about the Virtual High School project. To sum up their impressions of VHS, the panel had this to say:

The panel applauds the efforts of teachers and students who are pioneers in developing courses on the Internet that are challenging, interesting, and relevant. We see the project as beneficial in improving education by offering opportunities for a varied curriculum in schools with limited ability to do so. We hope that VHS will continue to grow and reach an even more diverse audience of schools and students.

It is significant that a group of disciplinary experts, having limited experience with online education, would spend a combined time of many person-weeks examining the VHS courses in depth and conclude their work by writing such statements.

PANEL STATEMENT

Our panel is enthusiastic about the potential that the Virtual High School offers to individual students, teachers, and schools. The project has great potential to redefine our understanding of how schools can use online learning to provide high quality instruction to students. Moreover, we believe that the VHS effort is making an important contribution to the redesign of American education, in part, because it foreshadows the potential explosion in the use of the medium as a vehicle for meeting expanding educational goals.

We thank Hudson Public Schools, the Concord Consortium, and SRI for this opportunity to review the Virtual High School Project and to offer specific course evaluations and other more general suggestions aimed at its improvement. We commend the timeliness of a VHS design to bring a new dimension to high school education through Internet access and delivery. We credit the U.S. Department of Education and VHS for funding and developing such a comprehensive model, based upon carefully considered approaches to design, implementation, and evaluation. Finally, we compliment the teachers and students, who have exhibited praiseworthy dedication to learning in allowing us to look over their “virtual shoulders” to examine, to reflect, and to offer constructive criticism.

The purpose of what follows is to convey how we arrived at our evaluation findings, to share our learnings about VHS course design and delivery, and to make recommendations for improving the final product. Our panel found this process to be challenging and intellectually stimulating. SRI has created a report that we believe accurately reflects both our process and our findings.

We believe the results of this evaluation process will provide valuable information for a variety of audiences. For the VHS teacher, the findings offer a tool for analyzing the strengths and weaknesses of what they have produced. For principals and other decision-makers looking to adopt or participate in virtual courses, the process and findings give them resources for analyzing the value and quality of netcourses. For those involved in the redesign of courses, the process provides guidelines for refinement. For the VHS system as a whole, we hope this evaluation process provides credibility that will help VHS to grow and move forward in a logical manner. Ultimately, our goal is to help provide a framework that will result in the creation and fine-tuning of courses that are more effective for student learning.

Standards of Quality

Overall, the quality of the courses reviewed was quite high. In our experience, these netcourses compare favorably to similar high-quality courses being delivered through other means.

The expert panel took the perspective that VHS courses must be held to the same high standard one would use to evaluate any high school course. We did not make the judgment that some content or courses should or should not be presented via netcourses. In the end we asked a simple question —“Will this activity, lesson, or course lead to deep and substantial student learning?” We therefore employed extant disciplinary content standards when we created the specific VHS standards used in this evaluation. Our standards reflect four important aspects of course quality: content, pedagogy, design, and assessment.

Panel members recognize that virtual course design is in its infancy and that we are just beginning to learn how electronic media can make learning more powerful. We staunchly support the use of high-quality standards, such as those created for this evaluation, in reviewing all pioneering work of this nature.

Observations or Learnings

While reviewing the VHS courses, we were struck by what we saw as key components that are necessary if a netcourse is to be effective. We note below some of these lessons learned:

- ✓ **Teacher “voice” is an important presence in each lesson.** Regardless of the quality of other material that can be “webbed into” or accessed during the lesson, the “voice and presence of the teacher” is an essential piece of each lesson, particularly in how the students are guided in their learning or in how the course is structured for engagement.

- ✓ ***Nurturing intellectual discourse is essential.*** Threaded discussions require multiple exchanges among students or an individual student and teacher. Lessons need to stimulate intellectual curiosity not easily satisfied by a single exchange or a short answer response.

Two additional key components of discourse are critical:

Feedback to students. Students need continuing and timely feedback about their work, how they are being assessed, and their current standing.

Feedback from students. Ongoing and summary feedback of student concerns, feelings, attitudes, and issues is important for learning and teaching. Each course should provide a non-threatening place where students can freely express themselves (as they might in a journal).

- ✓ ***Timelines and deadlines must be made clear and must be enforced.*** Students need to have a schedule of course work and completion dates, with explicit consequences if they are not met. In the online environment, students can easily fall behind and lose track, making it hard to get back on the learning path.
- ✓ ***Goals, expectations, and assessments must also be made explicit.*** Benchmarks of quality work should be offered along the way. Multiple means of assessment should be encouraged, including the creation of a significant product as a measure of students' learning.
- ✓ ***Prerequisites for course success should be clarified ahead of time.*** Any specialized learning skills, attitudes, or motivation should be noted. Access to and familiarity with sophisticated technology or Web skills should be identified. A strong orientation needs to be built into each course to address these areas. The amount of time and self-management skills needed to accomplish the course objectives should be addressed.
- ✓ ***Learning opportunities and materials should take full advantage of online resources: text, audio, video, and graphics.*** Support materials can be effective in anticipating a wide range of student needs or difficulties. Course designers and instructors should make full use of the Media Center and other support features of the course to broaden student engagement.
- ✓ ***Opportunities for active learning and collaboration should be given attention.*** Student collaboration, critical discussions, projects, experiments, significant products, problem solving, and critical thinking are extraordinarily valuable to learning and should be incorporated to the fullest extent feasible within course goals.
- ✓ ***Evaluating resources, materials, and information is a part of the online learning experience.*** Students need to be encouraged to develop the tools of critical thinking to evaluate sources of information.

Recommendations

The Panel suggests that there are a number of actions that should be taken to support the continuous improvement of the VHS model and the courses within it. These recommendations are targeted to VHS Staff, but the U.S. Department of Education should consider support that helps to make these recommendations possible.

1. Through the Teachers Learning Conference, or through other means, VHS should provide pedagogical guidance and support to teachers for course development that explicitly includes the suggestions made in the section above. It may be possible to provide templates that model approaches to integrating these elements into course design. While a template may curtail some creativity, more uniformity in design may facilitate movement from one area to another within a given course.
2. VHS teachers should be encouraged to revisit the course after implementation, and make their findings available to VHS staff as part of a course evaluation process. Questions to be considered

should be both broad and specific (e.g., Does the course meet overall goals? Are the right students taking the course? Are students finishing the course? Does the course description fit the course design and the way it actually occurred? Are URLs current?).

3. VHS should provide regular in-service training and support for VHS teachers to avoid perpetuating the isolation of teachers found in many public high schools (e.g., a forum for exchange and reflection [water cooler]; online mentoring; use of the expert panel's report and examples as "case studies" for small-group, guided reflection).
4. VHS should actively develop and provide a wide range of courses in order to serve a variety of student populations and to meet multiple learning needs. Courses in technical areas and School-to-Work applications might serve students not now participating in online courses. Similarly, developing courses specially targeted to areas of special need, perhaps by focusing on learning concepts that have been most difficult for students in traditional courses, might be a powerful use of the medium in reaching out to learners who have not succeeded under traditional formats.
5. The U.S. Department of Education should help VHS conduct periodic reviews of courses by outside evaluators.
6. VHS, the U.S. Department of Education, and the participating schools should be sure that VHS teachers are provided recognition and reinforcement for the heroic efforts they make in this pioneering educational area.

Conclusion

The panel applauds the efforts of teachers and students who are pioneers in developing courses on the Internet that are challenging, interesting, and relevant. We see the project as beneficial in improving education by offering opportunities for a varied curriculum in schools with limited ability to do so. We hope that VHS will continue to grow and reach an even more diverse audience of schools and students. For members of the panel, this has been a very worthwhile experience and we look forward to hearing more about VHS in the future.

Panel Members:

Joanne Grenier, Chair
Kathleen Fulton
Linda Mayfield
Steven Meiring
Michael Padilla
Leo West

FINAL REPORT

Introduction

The Virtual High School (VHS) began in 1996 as an innovative consortium developed to provide high-quality Internet-based courses to member high schools throughout the United States. These “netcourses” are taught by teachers from consortium schools and offered to students attending those schools. The project’s approach includes several main components. An online, graduate-level professional development course (the Teachers Learning Conference, or TLC), taught by staff from the Concord Consortium, is offered to prospective VHS teachers. All of the netcourses are taught using a common set of software tools that enables the consistent development and delivery of online courses. Hudson Public Schools and the Concord Consortium provide administrative and technical support and management of the program.

Some intended immediate outcomes of the project are (1) a set of high-quality netcourses that a variety of students can access from all over the country, and (2) the development of a group of teachers whose work in the TLC has improved their technological and pedagogical skills. Some of the ultimate outcomes anticipated by the program are students’ learning of new subject matter and associated positive attitudes toward the subjects addressed in the VHS course(s).

To date, SRI’s overall evaluation of the project has found that netcourse teachers have acquired new technological and pedagogical skills and content knowledge. The teachers have developed a number of innovative courses that would not have been offered otherwise, and VHS students have learned a substantial amount and improved their attitudes toward the subject matter of their courses.¹ Participants’ satisfaction with the courses, and with VHS overall, increased during its second year of operation (1998-99), as program operations became more routine. However, thus far the evaluation of the VHS project has relied primarily on self-report data from administrators, teachers, and students, augmented by field-site case studies.

Purpose of the Expert Panel

As a supplement to ongoing data collection through surveys and site visits, VHS commissioned SRI to collect additional data during recent months on the quality of a sample of the VHS courses that were taught during the first two years of VHS’s operations. Knowing

¹ A full copy of the first-year evaluation report can be found online at: <http://www.sri.com/policy/ctl/html/vhs.htm>. A report on VHS’ second year of operation will soon be available.

whether such courses are of high-quality is essential to the sustainability and scalability of the project. School principals and other administrators at participating VHS schools have reported to SRI that, on the basis of their own processes for course preparation and approval, they believe the courses to be of high-quality. However, participants in VHS also believe that it will ultimately be essential to establish course quality more concretely through an independent evaluation, so that employers, universities, other states, school districts, schools, and students will more readily accept the courses as maintaining high standards for learning. The panel of content area experts assembled by SRI (and described in detail below) to assess VHS course quality was established to provide a significant, objective, unbiased perspective.

To assist VHS in establishing the quality of its netcourses, SRI implemented a process that both established standards of quality for netcourses and reviewed existing courses against those standards. The process is intended to accomplish two main purposes. First, the standards established by the panel of experts, along with the panel reviews synthesized and reported by SRI, are designed to provide a credible, third-party assessment of the quality of VHS courses. By commissioning this external assessment of standards of quality in VHS courses, VHS is holding itself accountable to the U.S. Department of Education's Office of Educational Research and Improvement (OERI, principal funder of VHS), as well as to VHS staff and course creators, the students (and their parents) who have taken VHS courses, the teachers and schools that will give students credit for those courses, and future and potential participants in the program.

Second, although this course review process is separate and distinct from Virtual High School's own internal, ongoing efforts to establish high standards for netcourses, the SRI expert panel's evaluation of course quality is intended ultimately to inform and support those processes. VHS has a three-tier quality control process under development to ensure that all netcourses are of high-quality:

1. During the Teachers Learning Conference, each new (prospective) netcourse under development is reviewed by the TLC instructors to be sure that it is suitable for delivery over the Internet.
2. A Netcourse Evaluation Board (NCEB) was established by VHS to do brief reviews during the summer of 1999 of the quality of about 15 netcourses that were offered during 1998-99.
3. Beginning with the 1999-2000 school year, VHS "faculty advisors" will review courses while they are being delivered to students, for the purpose of checking on the quality of both curriculum and instruction.

VHS and SRI anticipate that the review process developed as part of this study, and findings from that process, will inform each stage of VHS's quality control process. The reviews will also contribute to formative feedback and improvement of individual courses reviewed; specifically, teachers of courses selected for evaluation will receive (or have already received) copies of the panelists' reviews for that course.

Contents of This Report

This report describes the charge of the panel of experts, the selection of courses for review, the standards established by the panel, and the application of those standards to each course. The last sections of this report describe the final outcomes of the review process and several conclusions that arise from those findings.

The Expert Panel

SRI formed and convened a panel of six subject matter area experts to assist in establishing standards for netcourses and to conduct course reviews. The panel was selected to include members with expertise both in subject disciplines (specifically science/mathematics, English/language arts, or the social sciences) and in standards development. Through their expertise, the panel has helped to answer the question of whether the courses being offered by VHS are meeting high-quality standards.

As a group, the panel has expertise in the core subject disciplines—including extensive secondary-level teaching experience in those disciplines—as well as statewide and national experience in the development and application of standards for curriculum, instruction, and assessment. Several of the panelists selected by SRI are also familiar with the use of distance learning, such as Web-based technology and video instruction, in elementary and secondary schools. Collectively, the panelists contribute substantial expertise to establishing a set of standards for evaluating netcourse quality. Exhibit 1 highlights the relevant expertise of each. (See Appendix A for more information about the panel members.)

Exhibit 1
HIGHLIGHTS OF PANEL MEMBERS' EXPERTISE

Steven Meiring	Ohio State Mathematics Supervisor for 25 years; author of addenda supplement to the NCTM mathematics standards; Ohio Statewide Systemic Initiative project
Michael Padilla	Professor at University of Georgia; contributed to national science education standards; principal investigator on Georgia's Statewide Systemic Initiative project
Joanne Grenier	Curriculum Content Specialist in Integrated History/Social Science and English/LA, Massachusetts Dept of Ed; reviews courses for alignment with state standards; helped develop Massachusetts history/social science assessment
Leo West	Past President of Pennsylvania Council for the Social Studies and East Allegheny Education Assoc.; author of AP History software; 24 years as high school social studies chair
Kathleen Fulton	Assoc. Director of Center for Learning and Educational Technology, University of Maryland; works with school districts to implement standards-based curriculum and instruction in English, language arts, and the social studies
Linda Mayfield	Immediate Past President of Virginia Assoc. of Teachers of English; helped develop Virginia's English/Language Arts standards; has taught English courses for 25 years

The expert panel assembled for two face-to-face meetings. Both meetings were held in SRI's Washington, D.C. area offices (in Arlington, Virginia): the first, a 2-day meeting on June 30 and July 1, 1999, and the second, a full-day meeting on October 25, 1999.² SRI served as host to these meetings, summarizing the process established by the panel, synthesizing the results of the panelists' reviews, and providing support for the work of the panel. At the first, 2-day meeting, the panelists agreed on a set of standards that would be used to judge VHS courses and also began the process of reviewing one of their assigned courses. At the second meeting, panelists reviewed the synthesis and compilation of their individual reviews, "calibrated" ratings across discipline areas, provided feedback on the findings and conclusions in a draft of the final report, and drafted a statement representing the panel's viewpoints on VHS, its courses, and the process for reviewing those courses.

Developing Standards for Netcourse Quality

A primary goal of the first meeting was to establish a set of standards against which courses could be reviewed to determine their quality. The panel was given the tasks of establishing the standards and utilizing them to answer the question that students, parents, teachers, principals, and administrators from other schools or universities might be posing: Are the courses being offered by VHS of high-quality?

² Attendees: Kathleen Fulton, Joanne Grenier, Linda Mayfield, Steven Meiring, Michael Padilla, and Leo West, panelists; Ray Rose, VHS (attended the first meeting); Mary Beth Donnelly (first meeting), Kyo Yamashiro, and Andrew Zucker, SRI.

To assist the panelists in making such a determination of quality for each course, SRI provided panelists with a draft set of standards prior to the meeting. Panelists reviewed the draft standards and revised them on the basis of their content area and standards development expertise. (See Appendices B and C for a copy of the first set of the standards and for the finalized version of the standards as incorporated into a rubric.)

The set of standards offered for discussion, as well as those finalized by the panel, are unusual in that they were specifically designed to be cross-cutting, across discipline areas as well as across types of courses (elective vs. required core courses). Despite the content-specific perspective or “lens” represented by each member of the panel, the group was able to reach consensus during the first meeting on some basic standards of quality for secondary-level courses. For example, the panel members agreed that the courses should teach critical-thinking skills, which should be present in each course, whether it is a science or language arts course, a one-semester elective, or a year-long Advanced Placement preparation course.

Focus of the Standards

Panelists felt it was important to be clear about the focus of the standards that the group established, and how they would fit into the larger picture of extant content standards. Panel members recognized the need for high but achievable standards for these courses, and felt it important to keep national content standards in mind as they proceeded. On the other hand, they also acknowledged that many of the existing sets of national and state standards might not be applicable, particularly since those standards are typically organized by grade ranges (e.g., grades 9-12) and therefore cannot easily be applied to an individual course.

Panelists drew from expertise in their discipline area, and from their experience with content standards, to ground the discussion in the larger standards landscape. They grappled with the issue of breadth versus depth. Although many of the courses may be elective and delve deeply into one particular aspect of a discipline, panelists felt it was important that the courses “make contributions to the larger discipline,” or, in other words, help students place the course topics and ideas within a larger context. Several panelists referred to their personal copies of state or national standards to broaden a few of the standards on the proposed list, so that breadth and depth were both appropriately addressed.

The standards for review of VHS courses are focused more heavily on content than on instruction. The primary reason for this focus is that quality is to be measured first of all by assessing whether the material being taught is important and well chosen. Another reason for emphasizing content is that the review process is intended to contribute to the VHS course

evaluation strategies after the current set of evaluation activities is complete. In other words, the process used here is likely to be adapted in the future to review *prospective* courses, for which instruction has yet to be implemented and which therefore cannot be fully evaluated. In addition, VHS staff, working with the Netcourse Evaluation Board, had already developed a set of standards that focused on delivery. Content was the missing link that VHS staff and OERI believed an outside evaluator would more adequately address.

Panelists discussed at length the unique nature of reviewing content (or instruction) in an online course. They discussed the newness of the Web-based technology as a teaching and learning tool and the importance of looking carefully at whether a teacher is using the characteristics of the medium in ways that effectively foster learning. On the other hand, panelists also recognized the need to be mindful of the bias that might surface in assuming that face-to-face discussions or lessons are intrinsically of higher quality than those occurring online. Panelists were sensitive to the fact that the reviews could be heavily influenced if the purpose or focus of these standards was not specified and clear at the outset.

Revising the Standards

The group focused on the standards at the outset of the initial meeting and returned to them periodically during the initial 2-day meeting. Panelists used their experiences and observations reviewing their first course to inform their discussions of the standards. The process for revision was iterative, with revisions spanning four or five drafts and covering a range of changes to capture concerns such as clarifying the language used, or applying a stronger emphasis on a particular idea by adding a new standard. Examples of points that were changed in the rubric to encompass some of the panelists' concerns include: the need for teachers to orchestrate discourse and collaboration among students; the need for multiple methods of instruction (not only assigning readings, for example); and the need for multiple perspectives (and values) to be acknowledged and critically analyzed within the course.

Panelists initially raised several questions that, with further discussion and contributions from the attending VHS staff representative, proved to be issues that are more appropriately addressed by the participating school, rather than by the teacher of the individual course. For example, panelists wondered whether each student would have adequate access to computers, during and after school, to complete all of the assignments. These types of resource and access questions, however, are the responsibility of the member schools and the coordinators that are assigned within the schools when they join VHS. Panelists agreed that those concerns are not issues of course quality, *per se*.

Panelists also questioned whether courses should be evaluated on the basis of the suitability of delivery for students' learning style or expectations (e.g., whether varying individual technology levels and learning styles are taken into consideration by the instructor in designing the course). In part, this was determined to be a responsibility of the school—the coordinator, administrator, and teacher should be working together to screen students to ensure that they are ready to be working individually. However, this is also relevant to how the teacher structures the course. From this discussion and several others, it was suggested that a new “Course Design” category be added to the rubric (see below).

The original draft standards document (see Appendix B) had an overall course quality rating, followed by 12 individual standards organized by category: 7 under Curriculum/Content, 3 under Assessment, and 2 under Pedagogy. At the end of the 2 days, the panelists had added the category “Course Design” for standards that panelists felt were more structural in nature (including both standards that were moved from other categories and new ones that were added), and they added several pedagogical standards and a standard about self-assessment. As shown in Appendix C, the final course review rubric contains the same overall course rating as the original, followed by ratings on each of 19 individual standards.

Overall Rating. The overall rating is a summary of course quality and is the most critical to the review process:

- A score of 3 indicates the course is of “high-quality.”
- A score of 2 indicates a course that is “satisfactory, but certain questions or issues need to be addressed.”
- A score of 1 indicates the course quality is “of serious concern.”

To provide supporting evidence and further detail on how such an overall judgment was reached, the final standards document adopted by the panel also contains 19 individual standards, organized into four areas: 8 under Curriculum/Content, 4 under Pedagogy, 5 under Course Design, and 2 under Assessment. Each area under which the individual standards are organized is briefly described below, but the rating rubric can be viewed in its entirety, with each individual standard listed, in Appendix C.

Curriculum/Content. The eight standards grouped under Curriculum/Content focus on the substance of what is taught, including information, skills, habits of mind, critical thinking, and problem solving. According to the standards, a course should, among other things:

- Emphasize important information, skills, and major ideas.
- Include a focus on critical thinking and problem solving.

- Strike an appropriate balance between breadth and depth.
- Match the materials, activities and assignments to the grade level and capabilities of the students.
- Handle any controversial issues in a responsible manner.

Pedagogy. The four standards grouped under Pedagogy focus on methods used in teaching the course. Among other things, high-quality courses in this area might be indicated by:

- Encouragement of students to take an active approach to learning the subject.
- Activities that promote students' interaction and collaboration.
- Effective use of the netcourse medium.
- An integration of multiple methods of instruction (such as readings, discussions, assigned writing, critiques, peer reviews, presentations, etc.).

Course Design. Five standards are clustered under the Course Design heading. The standards indicate that teachers should strive to:

- Structure courses to use the medium effectively, accommodate students' needs, and encourage regular feedback.
- Provide students with access to all needed materials.
- Provide a schedule of high-quality assignments and a set of performance objectives for students.

Assessment. Two standards are grouped under Assessment. The standards suggest that reviewers should rate whether they are able to find evidence that:

- Assessments are based on multiple indicators.
- The course appropriately guides students toward self-assessment.

Reviewers were asked to rate each individual standard under each of these areas on a scale of 1 to 4. A 1 meant the standard was "not evident" in the course; 2, that the standard was "somewhat evident"; 3, that the standard was "clearly evident"; and 4, that demonstration of this standard was "exemplary."

Besides providing numerical ratings for each of the 19 standards, reviewers were asked to provide written comments about the courses in each of the four areas (and also in the overall assessment area). The document provided space for commentary as extensive as the reviewers deemed necessary, where specific strengths and weaknesses could be described. The many pages of comments that the panelists generated provide detailed evidence supporting the reviewers' numerical ratings.

Applying Standards to Netcourses

A dozen VHS courses were selected for the panel to review. (This was the maximum number that was considered feasible for review in the time available.) Three courses were chosen for review during the initial meeting, one from each discipline area. Several hours during each of the two days of that meeting were dedicated to reviewing course materials online at SRI's computer center. The remaining time was spent discussing adaptations to the standards rubric, difficulties that surfaced during the review process, common issues that arose in each course, and comparisons of findings or potential ratings. Once the process was agreed upon during the initial meeting, reviewers went on to complete reviews of all the courses assigned to them.

Selecting Courses for Review

The sample of 12 VHS courses was selected for review by using the following criteria. First, the aim was to select courses developed and offered during VHS's first year of implementation (1997-98) that were also continued in later years. This continuity would increase the likelihood that the course had the opportunity to be further developed and refined after its initial implementation. Second, just as SRI selected panelists based on their content area expertise, the selection of courses focused only on those courses that fell into the core discipline areas: mathematics and science, English/language arts, and the social sciences.

In its first year of operation, VHS offered 29 courses. Eleven of the 29 were eliminated by using the criteria described above. Five courses were not offered again in the second year of implementation (the 1998-99 school year). Six were not in the core discipline areas; for example, several fell into the areas of foreign language, music appreciation, or technical courses, such as computer programming.

Eighteen courses remained in the final selection pool: 5 in English/language arts, 2 in math, 6 in science, and 5 in social sciences. (See Appendix D for a breakdown of the course selection process and the courses that remained in the final pool.) From these, SRI randomly selected 12, four each in the three areas of English/language arts, social sciences, and math/science. Selecting four in each of these general areas helped to simplify the division of labor among the experts. Each pair of panelists was assigned to review all four courses in his or her area of expertise.

Process for Reviewing Courses

One of the first steps in preparation for the reviewers' task was to have VHS staff establish an online orientation area for the six panel members. This orientation is similar to the introduction to the LearningSpace environment that students are required to complete before taking a VHS course. The orientation tasks take approximately 5 hours to complete and assisted the panelists in learning how to navigate the various areas that can be found within each course (e.g., the Course Schedule area, which houses assignments and deadlines). Panelists completed this orientation prior to the first meeting.

During the 2-day initial meeting, panelists spent a total of 5 or 6 hours reviewing their first course (with plans to revisit the course to complete their reviews following the meeting). By the end of the second day, most panelists seemed to feel they had a good sense of the direction of the course, the types of activities offered, the instructor's tone and style, and the overall organization of the course and the LearningSpace environment.

Reviewers were able to access a comprehensive set of materials to examine as they assessed the course. At their disposal during the review process were the course syllabus, online course descriptions, online tasks and assignments from the teacher, online dialogue (teacher-to-class, student-to-student, one-on-one teacher to student), examples of student work, and the teacher's comments and grading. In addition, with the help of VHS staff and the individual instructors, any applicable hands-on, supplementary materials that were used in these 12 courses (e.g., textbooks, novels, photocopied articles, etc.) were distributed to each reviewer.

Reviewers analyzed these physical and online materials at varying rates, sequences, and depths, although all reviewers reported reviewing materials in a comprehensive manner. Reviewers spent roughly 1.5 to 2 days examining course materials, evaluating the course on the basis of the standards rubric, and conferring with their partner. Some started by scanning initial assignments, examining the responses and discussions in depth following each assignment, and then examining samples of remaining activities as they grew more accustomed to the course. Panelists report using varying approaches to depth and coverage of materials, depending on the type of course and the type of materials used. For the most part, however, reviewers gravitated toward the following steps:

- Review the overview and introductory materials, including course objectives and expectations laid out by teacher.
- Scan all assignment descriptions and responses across the course or begin viewing initial assignments and resources sequentially and more in depth, and then sample from remaining assignments.

- View several randomly selected students' work on all assignments or all students' work on a selected sample of assignments.
- Check on the teacher's grading of assignments and feedback to students, and on student completion rate at end of course,
- Perform some form of confirmation that the sequence and coverage matched the original course description and objectives.

Some reviewers noted that the review process did not get shorter after reviewing multiple courses. The "learning curve" for each course seemed to begin again because the structure and organization of each course were slightly different.

The initial meeting modeled the structure encouraged for use throughout the review process. Discipline area partners were both assigned the same course to review during the meeting. Days were structured so that individuals could review course materials and dialogues on their own, then reconvene with their discipline partners to discuss, in pairs, their observations and any issues or questions that arose. In some cases, discipline partners walked through the course step by step together; in others, discipline partners delved into separate areas of the course and came back to discuss what they had individually uncovered.

Once partners had the chance to discuss their observations in pairs, the full group of six reconvened to return to the standards rubric and confirm that it would adequately capture some of the concerns that surfaced during their observations. The group discussed issues or concerns that were emerging in each course, how and where to rate those concerns, and how to appropriately discuss them in the comments section. Panelists were aware that their critiques might be used to inform individual teachers' curriculum and instruction, and agreed to use constructive language in discussing weaknesses and problem areas.

Partner discussions were seen as a necessary and useful component in maintaining the integrity of the reviews and in calibrating individual assessments. Partners were strongly encouraged to continue this collaborative approach in their future rating tasks, particularly once they had completed each rating sheet, before submitting them to SRI. Although the process certainly allowed for independent judgments and assessment, it also allowed for reflection and discussion with a partner so that different perspectives could be shared, comparisons could be made about ratings, and rationales and evidence behind those ratings could be discussed. Panelists were able to reach relatively close agreement in almost all cases. However, if reviewers could not come to agreement, their reviews were submitted with the discrepancies left unchanged. The review of only one course resulted in a divergence of opinion on the overall rating (see the Outcomes discussion below).

Some panelists noted that the task of assigning a discrete, quantified rating to an individual standard on a 1 to 4 scale, let alone the overall quality assessment on a 1 to 3 scale, was often quite challenging. On the other hand, panelists also acknowledged the need to numerically assign a value to simplify the presentation and to help readers get a clearer sense of their evaluations of the courses. For this reason, the “Strengths/Weaknesses/Comments” areas under each category on the form were crucial to the reviews and were well utilized, with many reviewers’ comments spreading over three to six single-spaced pages. Often, the comments corresponded to individual standards so that ratings on a given standard were presented with specific detail and rationale. The length and depth of comments demonstrate the care that the panelists gave to the reviews. Examples of reviewers’ comments are given in more detail in the following section and in Appendix E.

Outcomes of the Review

By the end of September 1999, the panel collectively completed reviews for 12 courses. SRI collected the 24 reviews for the 12 courses (2 reviews for each course) and synthesized the results.

Overall Course Quality Ratings

All but one of the 12 courses were rated as satisfactory or better. Six of the 12 were rated as “high-quality” (or 3), and another 4 courses were rated as “satisfactory” (or 2). Only one of the 12 courses was rated “of serious concern” (or 1) by reviewers. Furthermore, there was one instance where reviewers could not agree on the overall rating: one reviewer rated the course “satisfactory” but the other rated it “high-quality.” (The differing ratings are indicated by a ½ symbol in the exhibit below.) Exhibit 2 shows a tally of overall course ratings, including a breakdown by individual review, since two reviews were completed for each course.

Exhibit 2
FREQUENCY OF OVERALL COURSE RATINGS, BY REVIEW AND BY COURSE

<i>Overall Rating</i>	<i>Frequency per Review</i>	<i>Frequency per Course</i>
1	2	1
2	9	4 ½
3	13	6 ½
Total Reviews	24	12

Key: 3 is “High-quality”; 2 is “Satisfactory Quality”; 1 is “Of Serious Concern”

In the single case where review partners could not agree (see Social Sciences Course C in Exhibit 3), the discrepancy seemed ultimately to come from a difference in philosophy over how important certain elements are in determining the overall quality of a course. One reviewer felt

that the instructor's use and modeling of proper spelling, grammar, and usage in formal assignments and activities was critical for a course to be highly rated. The other reviewer felt that the quality of assignments, ongoing and supportive interaction of the teacher with the students, and skillful treatment of critical-thinking skills outweighed the concerns raised by spelling, grammar, and usage.

Exhibit 3 provides overall course quality ratings for each course reviewed, along with brief comments that describe the reviewers' findings although the table indicates that English/Language Arts courses were more likely to be rated as high-quality than courses in the other subject areas, it is not safe to say that this would be true looking across the entire set of VHS courses, because the sample of courses is so small. Neither do the results suggest that any other math and science courses are more likely to get lower ratings.

As Exhibit 3 demonstrates, at least one course in each discipline area was rated "high-quality." Themes in the types of elements present in courses rated "high-quality" emerged from the reviews. "High-quality" courses were likely to be consistently excellent and organized throughout most aspects of the course, and usually encompassed some combination of the following:

- Effective and appropriate use of the medium—e.g., presentation of materials is clear, students are provided access to a variety of resources and perspectives with the appropriate tools to help examine them, use of the medium is flexible in what can be accomplished on- and offline (some science courses can still do lab assignments, but might need additional support/supervision at the student's "home" school).
- Effective use of teacher's voice within the medium—e.g., teacher creates a structure to engage students in real substance and deep intellectual dialogue, and creates an environment to facilitate quality and sustained interaction and collaboration (e.g., student-to-student as well as student-to-teacher interaction).
- Diverse and multiple methods of instruction—e.g., a range of activities and assignments is presented, from problem solving to simulation to reader response, in order to consistently engage students throughout the course.
- Quick, timely, regular feedback—e.g., teacher provides continuous assessment of student work with follow-up and feedback on reasons things are marked wrong and suggestions for improvement.
- Clear objectives and performance expectations—e.g., benchmarks and models of performance are provided and made clear up front, and teachers have mechanisms in place for keeping students on track.

Exhibit 3
OVERALL RATINGS AND COMMENTS, BY COURSE AND BY REVIEWER

<i>Course</i>	<i>Reviewer 1</i>	<i>Reviewer 2</i>	<i>Reviewers' Comments</i>
Math/Science			
Course A	2	2	"[This] is a solid course that will be made better by revisions that examine how qualitatively to enhance the depth of student learning, how to enable students to work more collaboratively, how to improve the nature of assessments to make them more reflective of high-quality learning."
Course B	3	3	"Overall, this is an excellent course.... The selection of tasks that students were to respond to was quite varied.... The number of tasks was very high, [so] students could not put the course on 'cruise control'.... Congratulations on a job well done."
Course C	1	1	"This course has a great amount of potential, but [it] needs considerable work. In essence, I would rate the level of design and development to be at a 'pre-publication' level.... It was unclear what some components added to the learning.... Tasks were unclear.... The complexity of the material often interacted with the lack of clarity within the lessons to produce more confusion..."
Course D	2	2	"[This course] is a rigorous attempt.... The scope of what is covered is quite good.... [The text] communicates the appropriate information in an engaging and easy to read manner.... [After the holidays] the course falls into the age-old pattern of 'read the book and answer the questions at the end of the section'.... There were limited opportunities for students to interact with each other and with the teacher..."
English/Language Arts			
Course A	3	3	"This is a wonderful course!... It presents a wonderful learning opportunity for students to study important work in a supportive environment [where] they were challenged to apply skills of analysis, creativity, reflection, and abstraction..."
Course B	3	3	"[This course] is rated high...[it] offers a varied selection of reading, high-level analysis and questioning by the teacher, and a multitude of writing opportunities...to demonstrate [students'] understanding of the text.... The areas of course design and assessment of students' work need more attention..."
Course C	3	3	"The teacher has created engaging and rigorous assignments... detailed instructions accompanied all assignments and answers to missed questions on tests and quizzes were fully explained.... [Students] were both challenged and supported..."
Course D	3	3	"I want to take this course! It is great—a real model for other VHS courses... a great model for how to encourage students to work collaboratively, interact with each other, do team and whole class projects, and review and comment on each other's work..."
Social Sciences			
Course A	3	3	"This course is a rigorous challenging course that involves students in many tasks using diverse skills and tools of learning. It seems to address a variety of learning styles."
Course B	2	2	"This course has gathered an impressive array of materials, both electronic, and print.... A large percentage of students in this course either dropped out or completed assignments very minimally and haphazardly.... Feedback was generally terse..."
Course C*	3	2	Reviewer 1: "Generally an excellent course, well designed with rigorous content, solid assessment and good instructional strategies..." Reviewer 2: "Overall this is a challenging course but certain issues do need attention.... Throughout the course, the instructions and directions as well as feedback comments are rife with glaring spelling and grammatical errors.... Errors of spelling and grammar abound in student responses and these are never noted..."
Course D	2	2	"A challenging interactive course that encourages students to participate in exchanging ideas with fellow students and the instructor.... [There is] little variety in [resources] used in the course..."

Key: 3 is "High-quality"; 2 is "Satisfactory Quality"; 1 is "Of Serious Concern"

** = The single case in which reviewers did not agree on their overall assessment.*

Reviewers felt that these elements were the cornerstones of high-quality courses, but found that a few of even the high-quality courses were lacking in one or more of these areas. Two areas that seem to be the most challenging to achieve, for even the high-quality courses, are ensuring sustained, deep dialogue and collaboration among students, and providing consistent and ongoing feedback to facilitate self-assessment. Although the ease with which a teacher is able to maintain a high level of interaction and teamwork can sometimes depend on the “personality” of the group, reviewers felt that courses and lessons could be structured to capitalize on the group’s dynamic as much as possible. For example, one or two of the courses reviewed provided two distinct online spaces that provided, respectively, a safe haven for students to hang out together online and chat about whatever issues they wished among themselves, and an emergency bulletin board area where students submit urgent messages or questions to the teacher for which they need immediate feedback.

“Satisfactory” courses were generally missing more of these characteristics. Although satisfactory courses provide a good grounding in knowledge, skills, and concepts and a wide range of materials about the subject they teach, these courses often take a more traditional approach to the use of the medium and may have a heavier reliance on “paper and pencil” activities.

Although reviewers felt that their overall impressions of a course’s quality were difficult to quantify, their use of evidence in explaining their ratings was extensive, articulate, and specific. Moreover, our review of their ratings found a relationship between overall and individual ratings. One approach used to validate the conclusions reached in the overall ratings is illustrated in Exhibit 4. As the exhibit demonstrates, the distribution of individual standard ratings across possible options indicates a strong correspondence between the general and specific ratings assigned by our panelists. For example, those courses that were evaluated as high-quality were much more likely (62%) to receive exemplary ratings (4) on each individual standard. In addition, high-quality courses did not receive any ratings indicating that a certain standard was “not evident.”

Exhibit 4
PERCENT DISTRIBUTION OF STANDARD RATINGS, BY OVERALL COURSE RATING

Overall Rating*	Individual Standard Ratings				
	0	1	2	3	4
<i>Of Serious Concern (1)</i>	0%	16%	55%	29%	0%
<i>Satisfactory Quality (2)</i>	2%	3%	33%	48%	13%
<i>High-quality (3)</i>	0%	0%	4%	35%	62%
Totals	1%	2%	19%	39%	39%

Individual Standard Ratings: 0 is N/A; 1 is "Not Evident"; 2 is "Somewhat Evident"; 3 is "Clearly Evident"; 4 is "Exemplary"
**Note: Modal responses, by row, are shown in bold.*

Most of the individual ratings on those courses appraised as “satisfactory, with some concerns” were more or less split across the middle of the scale (2s and 3s), with almost half the ratings falling in the “clearly evident” category (3). It was very unlikely (3%) for a satisfactory course to have standards rated “not evident” (1). Ratings for the one course that was assessed as “of serious concern” were clustered in the “somewhat evident” category (2), with no exemplary ratings and several ratings indicating that certain standards were not evident. In only two instances reviewers encountered a course in which the standard seemed inapplicable (i.e., a rating of 0). In both cases (one social sciences course and one math/science course), the rating applied to the standard addressing the responsible nature in which controversial issues or materials are handled. In other words, reviewers felt that the standard did not apply because controversial issues did not arise in the context of the course.

Ratings by Standard

Each of the 19 standards could be rated on a scale between 0 and 4. A tally of ratings across all reviews indicates that the vast majority of ratings were spread across “clearly evident” (3) and “exemplary” (4) categories. Courses, on the whole, demonstrated at least some evidence of all 19 standards. Exhibit 5 illustrates the frequency of 0-4 ratings for all standards, across all 24 course reviews. Review partners, for the most part, gave ratings for each standard within a one-point range of each other. In fact, only about 2% of the 228 possible instances when review partners could have agreed or disagreed were cases in which they differed on a rating by more than one point (e.g., one rating the standard a 2 and the other a 4).

Exhibit 5
FREQUENCY OF RATINGS ON INDIVIDUAL STANDARDS

<i>Specific Rating</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Total # of Ratings</i>
<i>Total Frequency</i>	4	11	87	178	176	456

Individual Standard Ratings: 0 is N/A; 1 is "Not Evident"; 2 is "Somewhat Evident"; 3 is "Clearly Evident"; 4 is "Exemplary"

Considering ratings across each of the 19 individual standards, courses on average were rated highly (average of 3 or better) on most standards. In particular, courses were rated highest (on average) on their ability to handle controversial issues in a responsible manner (Standard 8, curriculum/content). More than half the reviews also gave exemplary scores to courses on other curriculum/content standards, such as their coverage of “important information, skills, and major ideas from multiple viewpoints” (Standard 1); their “considered treatment of breadth and depth” (Standard 3); and the modeling of “skills, tools, abilities, values and habits of mind” in the field (Standard 2). Most courses were not rated exemplary in clearly identifying the performance objectives that will be used to assess the students’ work, or in guiding students toward self-assessment practices (Standards 17 and 19), although most had at least some evidence of those practices. In fact, although the identification of performance objectives used to assess students’ work may not have been considered “exemplary,” more than half of the reviews indicated that this standard was “clearly evident.” More than half of the reviews identified courses as having “clearly evident” indications of integrating multiple methods of instruction (Standard 11) and of matching course work to the capabilities of students, with appropriate prerequisites specified and the course description accurately and clearly described (Standards 6 and 7).

Looking across the four categories of standards (curriculum/content, pedagogy, course design, and assessment), courses were more likely to get the highest rating (4) in the area of curriculum/content. (See Exhibit 6 below.) Most ratings on the eight curriculum/content standards were “clearly evident” or exemplary (3 or 4), with almost half of all ratings being exemplary (4). Very few (11%) of the curriculum and content ratings were only “somewhat evident” (2), and almost no ratings showed curriculum/content standards as “not evident” (1). In other words, according to the content experts, these netcourses, as a group, facilitate learning of important ideas, concepts, and critical-thinking skills and provide well-balanced and challenging materials.

Exhibit 6
PERCENT DISTRIBUTION OF STANDARD RATINGS, BY REVIEW AREA

Area of Rating	0	1	2	3	4	Total # of Ratings
<i>Curriculum/Content</i>	2%	1%	11%	38%	48%	192
<i>Pedagogy</i>	0%	2%	26%	39%	33%	96
<i>Course Design</i>	0%	4%	23%	40%	33%	120
<i>Assessment</i>	0%	6%	27%	44%	23%	48
Frequency Totals	1%	2%	19%	39%	39%	456

Individual Standard Ratings: 0 is N/A; 1 is "Not Evident"; 2 is "Somewhat Evident"; 3 is "Clearly Evident"; 4 is "Exemplary"
**Note: Modal responses, by row, are shown in bold.*

In both the pedagogy and the course design categories of standards, not quite three-fourths of all ratings were “clearly evident” or “exemplary,” with approximately 40% rated “clearly evident.” Approximately two-thirds of all ratings on the two assessment standards were “clearly evident” or better, leaving over one-fourth in the “somewhat evident” category and 6% showing no evidence of these assessment-related standards. It is important to note, however, that there were only two standards under the assessment category.

Understanding the Ratings Through Reviewers’ Comments

Besides to providing an overall quality rating and numerical ratings for each of the 19 standards, the reviewers were asked to provide written comments about the courses in each of the four general areas (and also in a fifth area called “overall assessment”). Reviewers generated several pages of comments to provide detailed evidence for their ratings. The comments, often extensive, provided insight not only into the rationale each reviewer might have had for the ratings, but also for the process by which the conclusions were reached. For example, one reviewer remarked that greater clarity about expectations and more instructions for what students should do (and why) in certain activities would be helpful in one particular course. To trace the process for coming to this conclusion, the reviewer gave details about how he followed the instructions outlined in a lesson and went to a particular Web site, read through the materials, and still found himself confused by what he should be doing. Comments often converged where the two reviewers of each course echoed common themes and issues. In some cases, reviewers used the term “we” to indicate that the review partners had discussed specific elements of the course and had reached the same conclusions.

Below, three courses are used to illustrate the types of comments used to support the ratings: a high-quality course, a satisfactory course, and the one course rated “of serious concern.” One of the highly regarded English/language arts courses and one of the social sciences courses rated satisfactory are examined here in greater depth to illustrate in what way the available evidence led reviewers to rate the courses the way they did. The only course rated

“of serious concern,” Math/Science Course C, is also included here, although it is important to note that there was only one such course rating.

Overall Rating. Each reviewer integrated the findings from the four standards categories into an overall course rating. Reviewers were enthusiastic about the courses that were rated “high-quality.” In general, the majority of features of the courses were considered to be exemplary, and the reviewers pointed to specific characteristics of the courses that merited the high rating. Both reviewers rated English/Language Arts Course A as “high-quality.” Overall comments accompanying this rating included the following:

Despite some concerns . . . this is a wonderful course! . . . It presents a wonderful learning opportunity for students to study important works in a supportive environment in which they were challenged to apply skills of analysis, creativity, reflection, and abstraction. . . . [I]wish I'd had the opportunity to take it. . . . [The instructor showed] exemplary skill as a teacher. . . . personal scholarship and expertise. . . . [The instructor's] love of content, enthusiasm for teaching it, and concern for all students shine through the virtual environment. Bravo! [Reviewer 1]

. . . an overall high-quality interdisciplinary course, creatively designed and taught by the dedicated and readily accessible online teacher. [Reviewer 2]

Along with the effusive praise for this course, these same reviewers also had some constructive criticism overall for the course.

The amount of work (e.g., reading and writing) is so extensive it may be too much for all but the very top students. That is too bad, as all students should be exposed to this kind of material, this kind of teaching, and this kind of thinking. . . . Depth may be sacrificed in the limited amount of time available to cover all this material. . . . Greater student responsibility for leading discussions, presenting reports and teaching to the group, becoming “topic leaders”, etc. could increase their involvement and their learning. (It would also remove some of the burden of being the “sage” and leader of all content delivery off the shoulders of the teacher!). . . . Greater use of multimedia materials might support various learning styles and add greater motivation. . . . There could be greater use of teamwork, peer review, and self-reflection among the students. [Reviewer 1]

Courses rated “satisfactory” (with concerns) had fewer individual ratings of exemplary, but, in most cases, more than half of the standards for these courses were rated “clearly evident,” indicating that the reviewers still had confidence in the courses in a variety of areas. Much like the high-quality course described above, the exemplar we are using from the satisfactory category (Social Sciences Course D) comes with a great deal of high praise.

Students have an opportunity to build their skills and then use them . . . [and] students are actively involved. . . . The instructor . . . sets up an atmosphere with high expectations for student work while exhorting them to do their best in all parts of the course, to challenge themselves to do well. Standards for quality written work were clear and were modeled by

the instructor. Students were given positive feedback and were encouraged to rework and resubmit assignments for credit. Students were constantly encouraged to think more deeply about the situations they were researching and reporting on—to ‘dig deeper’ and provide greater insights. . . . Sloppy thinking was not tolerated. Students were expected to show growth in their thinking and skills as the course went forward . . . [Reviewer 1]

A challenging, interactive course that encourages students to participate in exchanging ideas with fellow students and the instructor. . . . Instructor provides a firm but friendly environment and students feel free to express their ideas. . . . [The instructor] promotes excellence reminding students that this is an honors course and assignments submitted for evaluations should contain accurate content material and be free of errors in spelling. . . . Students have the opportunity to redo an assignment for an up-grade, thus promoting improvement and augmenting the desire to excel. . . . [This]course encourages self-directed learning and student responsibility. . . . [Material provided is] an excellent programmed learning packet providing reinforcement exercises for retaining knowledge. . . . [Students] engage in debate and prepare informal discourse that requires depth of knowledge. . . [Reviewer 2]

Concerns raised for this course focus on areas that seemed pervasive enough to raise some significant concerns. Often, as seen below, reviewers provided concrete suggestions for improvement on areas about which concerns were raised.

[There] seems to be limited use of the capabilities of the medium in creating a forum for the final [project]. Students complete and submit assignments to the instructor individually. While they are posted and can be read by others in the discussion area, there seems to be no orchestrated debate taking place. The instructor responds with comments about a student’s work so that everyone can see the type of response that is expected and occasionally directs a student’s attention to a piece of work as a benchmark, but interaction appears unstructured—happenstance. . . . [Besides a few listed] no other Internet assignments are given. . . . Perhaps there could be more peer review, response, and critique, required in the assignments. . . . Hopefully, [student] enthusiasm can be captured, encouraged, and built on to incorporate a component of student collaboration and discussion that utilizes the medium to a greater extent. . . . Making greater use of the electronic media [and media center] could enhance what is already a solid course. . . . [Reviewer 1]

Of great concern is the lack of URLs in the media center. . . . Enhancing experience with a variety of Web sites for interpretation, evaluations and content should be a priority. While students get the experience of searching, using and recommending URLs, there is little variety in the type of site used in the course (missing are cartoons, foreign government sources, opposing view points on the [topic], etc.). . . . The students had experience in use of the Web as well [as] a desire to excel. Perhaps an upcoming class might not be as enthusiastic and competent. . . . [Reviewer 2]

The one course that received a low rating (of 1) had many areas that raised concerns for the reviewers, but reviewers also had many positive things to say about several aspects of the course, particularly areas they saw as having great potential but needing further refinement. In Math/Science Course C, the reviewers felt the materials themselves showed promise, but, as seen in their concerns following these comments, the use and implementation of lessons around those materials needed more work.

This course is somewhat difficult to assess. A great deal of effort has been put into assembling the materials and presenting lessons. Students are introduced to numerous informative Web sites and interesting models. Much of the content reflects a plausible core for this student audience and would be of interest to them. Unquestionably, the instructor/designer of the course is very knowledgeable about the subject matter and is quite interested in conveying this course material to students. . . . In a few instances, student work showed depth, quality and insight. This was particularly the case with respect to the same set of students. . . . [Reviewer 1]

In general, I would say that this course has a great amount of potential, but that it needs considerable work. . . . The course contains material, which is rich in nature and would be very interesting to students of this age. . . . The course also contains a number of different kinds of lessons, which not only offer variety for the students but also ask them to use different kinds of thinking processes. . . . They are challenged to infer, hypothesize and to manipulate variables. This is an excellent feature of the course, a strength that can be used when building new and more refined versions of the course. . . . [Reviewer 2]

Reviewers felt compelled to give many detailed comments on the specific problems and concerns raised by this course—to provide a strong rationale for why the course merited its rating. In the overall comments section, reviewers noted the following:

The final analysis has to be placed on what the course delivers rather than its potential. On this criterion, the course represents a first cut or a work in progress, in need of further revision, restructuring, and narrowing of focus on what it expects to achieve toward students' learning. . . . I perceive the primary weakness to be in the course design . . . [with] most attention given to the sequence of the topics to be covered rather than to the learning outcomes which students are expected to achieve. Consequently, it is difficult to discern in what ways students are expected to mature. . . . [Course does not seem to be] a means toward contributing to students' broader capabilities and understanding as part of an overall high school curriculum. This is evident in ambiguity in assignments, absence of assessment criteria for students, and absence of connections across topics to convey to students why particular topics or activities are being undertaken. The underlying structure that connects the course topics and activities is not conveyed adequately for curriculum evaluation. . . . Of equal concern is the wide-ranging nature of student work expected by the course. . . . Too often . . . student work seemed more superficial—the product of personal opinion or short knowledge-level responses to specific content read. . . . [There was] limited evidence that students responded at [in-depth, problem-solving] levels. . . . Many students apparently did not “get to” later lessons involving these kinds of activities. .

. . . [There were] lesson designs that were often too long, rambling, ambiguous in directions, and ranging sometimes to very difficult content expectations of students. . . . Delivery of the course appears to be ‘loose,’ at best. . . . Week 11 was still “under construction” even though the course was delivered the previous semester. . . . Only two students (of 18) completed all activities. Several received grades of A or B while still having major assignments incomplete. . . . There seemed to be no effective mechanism for keeping students on schedule. [Reviewer 1]

In essence, I would rate the level of design and development to be at a “pre-publication” level. . . . Most importantly, I found the educational design to be lacking. There was no clear consistency of design. Some lessons were laid out in one format; other lessons used a different format. It was unclear what some components added to the learning (e.g., videos). Tasks were unclear. What was I supposed to do? What was I to turn in? How was I going to be evaluated? . . . The difficulty level of the material was also a problem. I could not find a listing of the pre-requisites for this course. However, it would seem that a minimal pre-requisite would be [two introductory high school courses]. . . . None of these major ideas is adequately explained for the student who had not really mastered these ideas in prior courses. Other material I felt was too difficult. . . . Moreover, the complexity of the material often interacted with the lack of clarity within the lessons to produce more confusion in me. If I were a student in the course I would ask, “He really doesn’t expect me to know all this, does he?” [Reviewer 2]

As one can see by the preceding comments, reviewers often went to great length to document the findings and observations that led to their overall ratings. Reviewers did not stop there. To provide even greater detail, reviewers also documented their observations on individual ratings in the comment sections of each area as well. What follows is a sampling of some of the verbatim comments that reviewers of these same courses provided in each of the four categories of standards.

Curriculum/Content. The eight curriculum/content standards, as described in more detail above, focus on the substance of what is taught, including skills, habits of mind, critical thinking, and problem solving. A summary of reviewer comments under curriculum/content standards for each of the three courses is provided below, with a selection of comments presented in the table that follows (Exhibit 7). As one would expect, reviewers offered both high praise and constructive suggestions for changes that, in their view, would strengthen each course.

The English/Language Arts Course A was rated very well on these standards. On a scale of 1 (“not evident”) to 4 (“exemplary”), the average rating on these eight standards, as judged by the two reviewers, was 3.75, a very high rating. Reviewers of this course were extremely pleased with the quality of the literature offered in this course and thought that the reader response, analysis, and interpretation fostered by the course were superior. On the other hand, although both reviewers were impressed with the selection of materials, they were also

concerned that students were being asked to cover too much, and that depth might be sacrificed for the breadth of the course.

The “satisfactory” Social Sciences Course D averaged between the two reviewers a 3.29 on the curriculum/content standards, a somewhat high rating. Reviewers felt that students in this course would get a good grounding in facts, ideas, critical-thinking and analysis skills, and addressing multiple viewpoints. Expectations for the course and the activities were outlined for students clearly, multiple times, and at specific levels. Reviewers were concerned, however, about the limitation of the resources provided to the students. Although they felt the workbook used was of high-quality, they felt that more use of the media center and an increased number and diversity of multimedia and other resources would greatly enhance the course. Reviewers also felt that the medium itself was underutilized, and could be used to require and structure more student interaction, peer review, and reflection.

The Math/Science Course C—which was rated “of serious concern”—was rated an average score of 2.38 on these standards. Although the course provided “tantalizing opportunities” and a strong mix and wide array of topics, issues, and resources, reviewers were very concerned about the unclear goals of the course and the wide variation in levels of expectations and criteria for many of the assignments. There were a few examples of assignments where students were given exercises to complete tasks that required critical-thinking and problem-solving skills, but these were found mostly in the second half of the course. Many of the assignments were not well explained or linked to prior materials, and reviewers were concerned that students did not have the background to understand or complete some of the assignments.

Exhibit 7
ILLUSTRATING THE RANGE OF REVIEWER COMMENTS FOR CURRICULUM/CONTENT STANDARDS

<i>Course</i>	<i>Strengths</i>	<i>Weaknesses</i>
<p>English/ Language Arts Course A</p> <p>Overall Rating: 3</p>	<p>Reviewer 1: A major strength of the course is its very well designed use of readings and writings around the theme [of the course]. Students reading these materials and participating in the course fully in the way the instructor has structured it will have a solid understanding of some of the most powerful and important writings in our Western cultural tradition. No small task! . . . The ways the students are encouraged to read, think about, analyze, and write about the readings encourages them to use the “habits of mind” of English scholars. This is excellent preparation for college and graduate level study and/or scholarship. . . . They were encouraged to interpret and make their own judgements, while also being asked to summarize important themes. . . . There were some very controversial topics that came up in this course and they were handled very well by the teacher.</p> <p>Reviewer 2: High-quality literature was selected for study. [The course] emphasizes critical thinking, reader responses, and student accountability. Students demonstrate comprehension through application, synthesis, and evaluation.</p>	<p>Reviewer 1: One concern . . . is the very ambitious amount of reading, writing and participation that is expected. . . . Both depth and breadth are emphasized, making it very challenging to support the depth of analysis while covering the breadth of content. . . . The number of readings required left less time for reflection and analysis. Students seemed quite overwhelmed, as shown by some who skipped some assignments or did them in a very cursory fashion, while handling other assignments with much more thought and effort. . . . Students who took [the course] came into the course with a much stronger basis. Those students who did not have this background, or any background in these readings, were placed at a significant disadvantage, making the course even more challenging for them in keeping up with both the materials and their peers. We suggest that this course should be advertised as requiring advanced or honors level skills . . . the high expectations for the class should be clarified. At one point the teacher noted that 3 comments per day would be expected—was that what was intended? If so, that’s a bit much, along with everything else expected of these students!</p> <p>Reviewer 2: Multicultural literature . . . could be used also. This addition might broaden the appeal of the course. . . . Depth is sacrificed as a result of an extensive breadth.</p>
<p>Social Sciences Course D</p> <p>Overall Rating: 2</p>	<p>Reviewer 1: During this course, each student learns major facts and ideas about [subject of course]. . . . Because modeling [a certain type of rhetoric] is encouraged in the student presentations . . . students learn the skills, tool[s], abilities, and habits of mind of [related subject]. . . . [which is something that] judging by the student responses and assignment submissions, they learned and practiced well. . . . Students’ growth in thinking, writing, and speaking . . . was facilitated by the instructor constantly encouraging students to expand on ideas, provide more clarification, or generally show more depth in their thinking. . . . The quality of submissions meets the high standards that [the teacher] constantly (but gently) reminded students about. . . . The course is very focused giving depth to the workings of [the topic]. . . . The skill development builds throughout the course until students use them in the final three-week [project/activity].</p> <p>Reviewer 2: Facts and ideas are taught and multiple viewpoints emerge. . . . There is emphasis on accuracy . . . instructor models error free instructions. . . . Daily assessments indicate that students comprehend important information about [the subject] Critical thinking is promoted through analysis of [materials provided and activities]. . . . students were encouraged to express their personal viewpoints in informal discussion.</p>	<p>Reviewer 1: While the course materials and difficulty level match the nature of the required work, the materials are limited to the student workbook [and some specified Web sites]. . . . One student . . . supplied a list of 14 sites she had researched in anticipation of taking the course. These other sites could be included by the instructor for expanded student information and utilization of the medium. Not all groups of students may be as independent or technologically facile as these were. There is also the question of time and access for the students doing research on the net. Some links in the media room might assist these students. . . . There is an opportunity here to generate an exciting environment for student interaction thru the design of the assignments. In the “live” classroom, it would happen spontaneously. Online, the structure needs to be developed through assignments or instructions in how to participate so that all students are responsible for interacting with each other. Most students did eventually ‘speak to’ [other submissions from students]. Another group might benefit from requirement to react and interact—especially if they are less involved than this group was.</p> <p>Reviewer 2: Lack of URLs may limit experience. . . . Additional URLs could enhance this experience.</p>

Exhibit 7

ILLUSTRATING THE RANGE OF REVIEWER COMMENTS FOR CURRICULUM/CONTENT STANDARDS (concluded)

<i>Course</i>	<i>Strengths</i>	<i>Weaknesses</i>
<p>Math/ Science Course C</p> <p>Overall Rating: 1</p>	<p>Reviewer 1: This course contains an interesting array of topics and issues concerning the [topic], including manipulation of models at external Web sites and a number of video segments. . . . Several students responded quite positively to the activities in the first half of the course. This was more difficult to judge for the second part of the course since so few students reached or completed those activities. The course is tantalizing in the sense of opportunities presented (interesting Web sites, presentation of topics of interest to students, opportunities to manipulate models, development of intriguing [discipline area] issues). . . . However, they are introduced to a variety of viewpoints . . . as well as interesting contrasts. . . . In some lessons, students are asked to engage in suitably strong scientific activities such as writing and testing a hypothesis . . . or practicing good habits of scientific observation. . . . Questions and assignments given to students range over an entire spectrum from information-response to analytical questions. Sometimes these questions and activities are appropriate for the grade level and [subject-related] prerequisite for the course; in other instances, this is questionable. For example, [one lesson] involved very complex material with a university-level reading difficulty. The activity. . . . involved considerable prerequisite information about [topics] that I doubt would be gleaned from an average [subject area] class. . . . Many models that students encounter in the course are quite intriguing. . . . [and] examples of the rich contexts in which students had the opportunity to manipulate variables to determine the effect. . . . Sometimes students are asked questions about these models that require higher levels of thinking. In other instances, it is not clear what the learning expectations are for carrying out the tasks associated with these models. Those activities that seem richest in engaging students in critical-thinking, problem solving, and group work . . . occur in the second part of the course.</p> <p>Reviewer 2: The course provides a strong mix of [discipline area] principles along with ethical, moral and value based principles upon which students are asked to make decisions. Thus if students truly understand all the [discipline and value] considerations presented, they will leave the course with a thorough understanding of numerous [subject of course] issues.</p>	<p>Reviewer 1: However, it is frustrating in the sense of trying to get a handle on the exact nature of what it is trying to accomplish. . . . Students do not seem to be required to refer back to the various theories presented [in the treatise assigned in the introductory week]. . . . Nor are they exposed to formal tools or definitions of ethical perspectives for forming judgments or making decisions. In other lessons, they are merely asked to adopt a position and support it from related readings or their individual experience. . . . Lessons often are a mélange of differing levels of student expectations—opinion questions, critical thinking, and self-reflective activities contained in the same lesson array. Sometimes lessons are long and rambling, with several different parts, ranging from Web searches to short answer questions to directed activities. I can easily imagine students wondering whether they are really intended to do everything, and, if so, to what level of detail. . . . Whereas occasional open-ended assignments are worthwhile, too many instances of this type leave the student in a quandary as to the specific outcomes and depth of work expected. In the absence of explicit lesson discussions about how students are being assessed, it is a likely reaction that many would take the course of least resistance in doing the minimum expected to satisfy the task. This likely explains the general lack of depth of student engagement with many questions and activities. (There were notable exceptions, but these were usually the same students.)</p> <p>Reviewer 2: The point is whether all the students can and do really understand the . . . notions that were introduced. In many cases these ideas are presented in a somewhat brief format. This requires that students either dig into other sources for deeper explanations or remember the ideas quite well from previous courses and experiences if they are to learn from the course. I would predict that there would be a significant number of students who would do neither of these and thus they would not learn all that was intended. . . . The week 7/8 activity. . . . is a challenging and potentially very useful task. I wonder if students know enough to be able to finish the task with some degree of certainty that they had done it correctly. While the example that was provided was useful, I do not know that other background information was available to help students. . . . The point is whether they really do know this material from previous courses. The present course does not give enough background to those without it. . . . Finally, there are few criteria communicated to the students about what they should hand in for this assignment [week 9]. Left to their own discretion, many students hand in the least possible. The record indicated that students did just that. This is obviously not what was intended from this very worthwhile task. . . . The week 6 material. . . . is very complex material indeed. I viewed several of the [sites] and frankly found the material to fit into three categories. The first was material that fit the topic. . . . The second [was] material that appeared to fit, but I did not know what to do with it. . . . The third [was] material that is difficult beyond the level of most high school students . . .</p>

Pedagogy. The four standards grouped under this heading focus on the types of instruction and guidance used by the instructor to teach students important concepts and how to use them. Exhibit 8 illustrates some of the comments that reviewers offered for the three courses on the standards related to pedagogy.

The quality of pedagogy in English/Language Arts Course A was rated highly by the reviewers, with an average rating of 3.4. The reviewers were impressed by the discussions, students' collaboration, and the teacher's respect for different points of view. They also noted the variety of activities in which students were engaged. Weaknesses that were identified included missed opportunities for student-led activities and the relative paucity of opportunities for students to search the Web.

Social Sciences Course D did not rate very highly on pedagogy, earning an average of 2.5 from the reviewers. The teacher's daily presence online was considered a strength, as was the use of multiple methods of instruction (including role-playing, simulations, research, creative writing, and debate). The relative lack of facilitation of student collaboration or interaction was considered a weakness, as was the infrequent use of the Web, particularly in a course that could have made much better use of that medium.

Math/Science Course C also did not rate very highly on pedagogy, with an average score of 2.5 for those standards. The reviewers noted the use of good questions posed by the teacher and references to many interesting Web sites. But both reviewers were disturbed by an overreliance on "surfing the Web" as a technique for learning material. Not enough guidance was provided to students. One reviewer noted that his experience suggested that many students are not yet able to use the Web effectively without more guidance. The other reviewer suggested that more of the basic material needed to learn the subject should be provided in the course itself, not left for students to find on the Web.

Exhibit 8
ILLUSTRATING THE RANGE OF REVIEWER COMMENTS FOR PEDAGOGY STANDARDS

<i>Course</i>	<i>Strengths</i>	<i>Weaknesses</i>
English/ Language Arts Course A Overall Rating: 3	<p>Reviewer 1: Open discussion and sharing were always encouraged. This seemed to lead to greater student involvement and a sense of safety in the discourse community.</p> <p>Reviewer 2: Students are frequently encouraged to respond to the literature, the teacher's comments, and other students' responses in the Discussion Room. . . . Students' instruction includes assigned readings, online discussions, assigned formal and informal written assignments, critiques, peer review, individual and group presentations. . . . Students are required to be active participants and collaborators. Both students' and the teacher's voices are used appropriately and frequently.</p>	<p>Reviewer 1: While interaction was encouraged between teachers and students, and among students, we felt that greater opportunities could be provided for students to direct the discussion and take direct responsibility for some of the interactions. . . . This would also help students achieve some of the depth we feared was sacrificed for breadth. It would also make the class less "teacher directed" and provide more student responsibility for taking charge of sections of the class—e.g., each could pick a topic or reading at the beginning of the semester and others could turn to him/her through the semester for guidance on this topic.</p> <p>Reviewer 2: The course helps students make use of the medium through interaction online; however, students only minimally search beyond the course. Students could "search the Web" more extensively as an addition to the current course.</p>
Social Sciences Course D Overall Rating: 2	<p>Reviewer 1: The students themselves seemed to initiate discussions and take charge in the discussion room. . . . During this time, [the instructor] was using the discussion room to create an atmosphere where students are comfortable, challenged to do their best, encouraged to redo and resubmit work that doesn't quite measure up, but are never embarrassed. . . . The course built skills needed for the final simulation during the first 13 weeks with assigned reading, posting[s], position papers, [etc.].</p> <p>Reviewer 2: The teacher is online daily and most students follow a similar pattern... The course uses multiple methods, including role playing, simulation, research, creative writing, debate, and informal discourse.</p>	<p>Reviewer 1: There seemed to be little interaction with each other required of the students. . . . Most assignments were simply completed and submitted to the instructor. . . . Techniques facilitating students' reactions to each other weren't obvious. Did students have a choice as to whether or not they responded [to certain assignments]?</p> <p>Reviewer 2: Extensive interaction with the Web does not seem present. . . . [The course] neglects diverse Web site opportunities that could enhance student use of the Web.</p>
Math/ Science Course C Overall Rating: 1	<p>Reviewer 1: There are aspects of the course that get students actively engaged in learning [including] examples of using interactive features of Internet sites effectively. . . . Students are referred to many interesting and informative Web sites throughout the course. . . . To encourage interaction with other students, there were a number of discussion threads initiated by the instructor.</p> <p>Reviewer 2: The types of and levels of questions asked with many of the assignments are excellent. The questions are very thoughtful in nature and should, if the students take them seriously, contribute to significant learning. This is the type of learning that is stressed in the National Science Education Standards.</p>	<p>Reviewer 1: The weakness in the course is that it places very heavy reliance on students' prior ability to use the Web effectively. Frequently, students are instructed to search the Web on a topic with little other direction than to "surf the Web and find out why. . ." I personally found this disquieting given my own experience with the mixed ability and experience levels of students to do this kind of general search. This became problematic in my review of the course when icons embedded in the text (to take me to a referred Website) produced a Web page instruction that the site was no longer available. . . several of these sites were so large that it would have been exhaustive to search for the specific activity I was supposed to see. . . . [Also,] the format of presentation of the lessons tailed off rapidly after about the first third to first half of the course. Lessons assumed a very dry, recipe format that began with the lesson title, followed by a direction to go to the media center, where the objectives were stated in "teacher terminology," followed by questions or activities students were expected to engage in, and then directions to a Website or to a Web search. . . . Part of the weakness of the course is that the underlying structure of objectives and connections is not evident.</p> <p>Reviewer 2: I had problems with some aspects of the lessons. For example. . . . I would not be able to identify [certain requested features in a lesson] and would not know how to do so. . . . The pedagogical strategy in which students are told to "utilize the links and the World Wide Web to research answers to the questions that follow" is not adequate or appropriate for high school students. Yet the strategy is continually used. . . . Instead, basic material needs to be provided within the course itself.</p>

Course Design. The standards clustered under this heading concern primarily how the course is structured to enhance instruction, use of the medium, and quality of assignments. Exhibit 9 presents reviewers' comments in the area of course design.

The reviewers' average rating for course design standards for English/Language Arts Course A was 3.80, exceptionally high. In 8 of 10 cases (i.e., 2 ratings each on 5 course design standards), the ratings indicated that the course design was "exemplary." Reviewers felt the instructor had done a "good job" in guiding students with strategies for staying involved and on track through the course of the semester. High-quality assignments and regular, positive feedback seemed to be the rule. Reviewers were not sure, however, what the performance objectives of the course were and what the consequences of not meeting them (and not meeting deadlines) would be.

Average ratings on course design for Social Sciences Course D were 2.9, on the high side of the "somewhat evident" category, although almost every rating on standards in this category was "clearly evident" (3). Student expectations, grading policies, and performance standards were clearly explained and reinforced in this course, with reviewers mentioning daily feedback and firm, friendly comments on the part of the instructor. Again, increased use of the Internet, use of the media room, and more variety and creativity in the types of assignments were encouraged.

Math/Science Course C rated an average of 1.7 on these standards, a fairly low rating. Reviewers found strengths in some sophisticated readings that were offered, some lessons using interesting and colorful visuals, and some lessons that required higher-order tasks, such as hypothesizing, questioning, and interpreting. However, it was clear from the reviewers' comments that those types of lessons were not consistent throughout the course and that expectations on assignments and in the course were often unclear, "excessively long and complex," and sometimes questionably linked to the background and materials provided in the course.

Exhibit 9
ILLUSTRATING THE RANGE OF REVIEWER COMMENTS FOR COURSE DESIGN STANDARDS

<i>Course</i>	<i>Strengths</i>	<i>Weaknesses</i>
English/ Language Arts Course A Overall Rating: 3	<p>Reviewer 1: The teacher did a good job in guiding students at the beginning of the course to set up notebooks, keep track of assignments, go back to be sure that assignments were recorded as turned in, see what comments were made, stay involved on a regular basis so as not to get behind. There was good 'classroom management' throughout the course. The teacher gave regular and detailed feedback to students. She nudged where nudging was needed, and celebrated the positive things that occurred.</p> <p>Reviewer 2: High-quality assignments dominated throughout the course.</p>	<p>Reviewer 1: We weren't too clear when and how performance objectives were presented—they seemed to evolve but became more formal and clarified over time. Perhaps this is natural in a course like this, as midcourse adjustments must be made?</p> <p>Reviewer 2: Expected due dates were clearly posted; however, consequences of not meeting due dates were not clearly evident.</p>
Social Sciences Course D Overall Rating: 2	<p>Reviewer 1: The use of the medium was adequately explained. . . . The structure of the course, as outlined in the workbook is comprehensive. . . . Assignments and schedules were clear and all but one student completed the course with high grades. Students were given encouragement and opportunity to catch up on late assignments or to resubmit those of lower quality. . . . Students were held accountable for submitting work on time and grades reflected the consequences that had been established for late submissions. . . . Performance objectives were identified at the beginning of the course and students were required to summarize and submit them as part of one of their early assignments. Standards and expectations for work are high and students met them. Work was submitted regularly and received excellent, positive feedback. . . . Students were sometimes directed to look at particular submissions of another student as a benchmark for the quality [expected by the teacher]. . . . Feedback was designed to encourage students to expand their thinking and to grow in the course.</p> <p>Reviewer 2: This class seems exceptionally able and needed little help in use of the medium. Students helped students with tech problems. . . . Assignments and due dates were posted clearly...Daily feedback seemed to be the rule. Comments were firm and friendly. Performance standards are clearly stated along with the grading policy.</p>	<p>Reviewer 1: The media room was not used at all. . . . All assignments basically came from the workbook with a few additional questions requiring use of the Internet. . . . There may be creative ways to make better use of the opportunities provided in cyberspace.</p> <p>Reviewer 2: The lack of media resources might be a weakness in a class less motivated or able.</p>
Math/ Science Course C Overall Rating: 1	<p>Reviewer 1: Some Web sites consisted of very sophisticated readings. . . . lessons had very interesting and colorful visuals. . . . Students even commented about how classmates in their labs (not taking the course) became very interested.</p> <p>Reviewer 2: Lesson objectives were provided for some lessons and these matched the activities that students were asked to complete. Many of the objectives asked students to perform higher order tasks such as hypothesizing, questioning and interpreting. It would have been helpful if all lessons were so organized. . . . The graphics included in many of the lessons added considerably to the appeal of this course. Various graphics were used to denote that students were to email the teacher if they had problems. These were effective. Other graphics could be a nuisance since they relate only marginally to the course content.</p>	<p>Reviewer 1: There appears to be very uneven presentation of reading ability and formality of presentation required for study of course materials. . . . The instructor's written text varied from a tone of "kidspeak" to use of terminology like "Question the veracity of your assumptions." I would suggest a more even presentation requiring a rewrite. . . . at a lower level of sophistication, use of alternate information sources, and a presentation tone more suitable both to the students' age group and good models of communication. . . . A more judicious use of background size and text color [is recommended]. . . . Other lessons were excessively long and complex in the various parts students were expected to answer and activities that they were expected to complete. Breaking these lessons up into separate, related assignments would have helped. These are instances... that a revision could tighten up in terms of structure, appearance, effectiveness, and ease of communication. . . . Though there were due dates...these due dates did not seem to be adhered to by prompt instructor follow-up when students began to lag behind. The course did not seem to be paced for the amount of time required to complete later topics. . . . more sophisticated lessons coming later were not covered by more than half of the students. . . . [The instructor needs] to be more specific about overall performance expectations for students. . . . Specific skills, abilities, or habits of mind that were expected. . . . were not made explicit.</p> <p>Reviewer 2: I did not understand the significance of the movies embedded into several of the lessons. . . . It took a significant amount of time to load. . . . and did not seem to relate in a significant way to the point of the lesson. . . . Directions to tasks could be a little confusing. . . . The layout of lessons also could be confusing to students. . . . [e.g.,] within one lesson students have to do three tasks. If I have a problem with this, I believe that students would also be confused. It is also possible that students would simply select one set of questions to respond to and ignore the other...I believe it would be easier to break these long lessons into smaller more discrete lessons that students could more easily digest. While the best students might do just fine, those needing some extra organizational help would probably flounder.</p>

Exhibit 10
ILLUSTRATING THE RANGE OF REVIEWER COMMENTS FOR ASSESSMENT STANDARDS

Course	Strengths	Weaknesses
English/ Language Arts Course A Overall Rating: 3	<p>Reviewer 1: There were many assignments as well as opportunities for “extra credit” for work done particularly well. Participation as well as written assignments were evaluated and graded. Students could always know their current grades and seemed to dig in and work harder to pull up their averages after getting a particularly low grade for a weak or unfilled assignment.</p> <p>Reviewer 2: Students were encouraged toward self-reflection in their assignments.</p>	<p>Reviewer 1: We didn’t find evidence of students being asked to evaluate each other’s work, or their own work. There could have been more opportunities for reflection on what they were learning, and where their personal strengths and weaknesses lay.</p> <p>Reviewer 2: Rubrics for guiding students toward self-assessment would be helpful.</p>
Social Sciences Course D Overall Rating: 2	<p>Reviewer 1: Grades were based on student performance on many tasks over the length of the course that reflected the objectives of the course. . . . [The activities] led to reflection on their learning and appreciation of the role of the [subject of course] in today’s world.</p> <p>Reviewer 2: Daily feedback suggests that assessment is on-going and students are constantly reminded to excel. Students are directed to become self-motivated, self-guided learners and gently [urged] to do their best. Some students apologize when they submit careless work.</p>	<p>Reviewer 1: [All tasks] were “paper and pencil” tasks.</p>
Math/ Science Course C Overall Rating: 1	<p>[None listed.]</p>	<p>Reviewer 1: I was unable to find any discussion with students of how they were to be graded for the course other than two general paragraphs in the course description. The instructor’s commentary to students’ completed assignments did not answer this question. I found no evidence of an assessment rubric or specifically stated list of performances expected with individual assignments, upon which students might be graded. In perusing students completed work for the course against the grade earned, I found these anomalies: (1) one student received an A+ with nothing completed beyond week 6; another received an A+ with incomplete work after week 8; (2) students received grades of D, C-, C-, and B with work completed only through week 3. It was not clear to this reviewer how grading was assigned to individual assignment work. There was considerable variation in quality of individual student responses to individual assignments. However, I was unable to discern how the course tried to engender more insightful or deeper feedback from students when this level of student response was missing. (For example, it would have been interesting to post an exemplary student’s work as a model of what <i>could</i> have been done with particular assignments.) I also saw very limited quality interactions among students in a team or collaborative environment. There were several examples of questions that were self-reflective for students to answer, but not turn in. However, it was not clear how those or other activities were expected to guide students toward self-assessment or reflection about their learning. (Although students were requested in the first week to write a “Personal Code of Ethics” against which they were to compare a similar product at the end of the course, I found no evidence that this was completed at course’s end.)</p> <p>Reviewer 2: It was unclear to me exactly how assessment and grading were to be accomplished. I saw very little that described the assessment procedures, beyond what was included in the course overview which was very general. I would infer that the student work and discussion topics would somehow be combined to formulate a grade. The exact way that would occur is unclear to me.</p>

Conclusions

The expert panel convened by SRI accomplished much in the space of a few months. The members' prior experience in examining a variety of high school courses, their familiarity with standards for curriculum, instruction, and assessment, and their ability to work well together as a team made it possible for the panel to work through many complex issues in a short time. Once they became comfortable with LearningSpace, the panel members applied standards to the materials and artifacts—including both online and physical materials—for four VHS courses each, exchanged views with their partners, prepared lengthy comments, and reported the results to SRI.

This course quality evaluation process has proven the feasibility of using an expert panel to conduct independent, third-party reviews of VHS courses. A number of other conclusions and recommendations can also be drawn from the process and the work of the panel.

VHS courses provide students with high-quality curriculum content. As stated at the outset of this report, the quality of VHS courses will greatly influence the success and continued support of the Virtual High School project. This review found that experts rated 11 out of 12 courses at least “satisfactory.” Six-and-a-half courses—over half of the courses reviewed—were rated as “high-quality.”³ More specifically, the expert reviewers rated the area of curriculum/content especially high for a large majority of the courses reviewed. These findings indicate that VHS's emphasis on multiple, interweaving quality control mechanisms has begun to pay off in many respects.

It is important to note that the standards of quality were created independently, after courses had already been implemented for one or two years. Thus, the courses evaluated were developed and implemented without having had these particular standards as goals and benchmarks. That the courses were rated well despite this fact says a great deal about the quality of preparation that already goes into each course. Now that the standards have been established, it remains to be seen how the standards will be integrated into the course development process.

VHS should continue to focus on curriculum content and on quality control. Although VHS has had impressive results in such a short time, the one course rated “of serious concern” raises questions for VHS as it expands to about 100 courses this year and perhaps 300 courses in years following. If the fraction of courses raising serious concerns were to continue at just over 8% of courses, the numbers of courses needing serious attention could potentially be in the range of 8

³ The “half” denotation signified the one course that received different ratings from the two reviewers (one rated it a 3 and the other rated it a 2.)

courses in 1999-2000 or 25 courses in 2000-01. Such low-quality courses could potentially affect dozens of VHS schools and hundreds of VHS students. For this reason, assuring adequate development of each course before bringing it online is critical so that even courses offered for the first time meet high standards. Also, ongoing support of courses will be important, to guarantee quality implementation. To maintain and even increase the high-quality of its courses, VHS will need to continue, if not increase, its vigorous focus on high standards and accountability for its courses. VHS should:

- ***Front-load the course development process with a focus on content so that design is coherent from the beginning.*** Because this expert review process appeared to be a productive and constructive undertaking, VHS may wish to consider integrating the content standards and review process into its own quality control processes. For example, more emphasis on content standards could be added to the professional development and course development activities associated with VHS's Teachers Learning Conference (TLC).
- ***Focus on the quality of curriculum content in ongoing teacher support.*** Perhaps VHS could train the new faculty advisors (added this school year) to use the standards as part of their review of and support for the set of courses in their discipline. Like members of the expert panel, the faculty advisors will bring with them the perspective of discipline-based experts who are familiar with a wide variety of high school course offerings. Faculty advisors could provide feedback to teachers after initial implementation, similar to what was provided by the expert panel.

At the very least, the reviews conducted by the panelists serve as a useful, formative feedback tool for the teachers offering the courses that were evaluated. The experts' reviews are lengthy, detailed, and constructive. There are many specific suggestions that the teachers of those courses are likely to find worthy of consideration.

The review process worked well, but it was challenging and time-consuming. The review process worked very well on many levels. For example, the overall ratings of quality were well supported by the ratings on the 19 individual standards and by reviewers' extensive comments. As expected, interactions among panel members have been critical to the success of the process. Discussions at the face-to-face meetings of the panel, comparing impressions of course quality across discipline areas, helped panel members "calibrate" their ratings and develop confidence that the standards were sufficient to be used effectively across three (or more) disciplines. The exchange of information between discipline area partners was also important in comparing and gauging results and evidence.

The results of the 24 reviews were remarkably convergent. Not only were there very few conflicts of opinion on overall ratings—only one instance was presented where reviewers did not agree on the overall rating—but reviewers were consistent on individual ratings as well. Only

about 2% of the ratings differed by more than one scale point. However, as consistent as these results might be, the few discrepancies noted in the report indicate how difficult it is to eliminate incongruities entirely.

Reviewers commented throughout the process that there were times when it was extremely difficult to boil down their judgment to a single numerical rating. Ratings were seen as general comments on standards, and the reviewers' commentary was seen as the more precise and specific assessment of the elements found in the course. Through group and partner discussions, reviewers were all able to complete their ratings and use their textual comments to address more subtle disparities or concerns. Discrepancies are especially challenging to overcome, however, when they involve philosophical differences. The case in which two reviewers could not reach agreement on the overall rating of a course appeared to be a conflict of opinion over how much weight particular aspects should have in influencing overall ratings of quality. Coming to conclusions about the appropriate numerical ratings or the weighting of certain elements over others, therefore, often takes careful consideration and deliberation.

The process undertaken to review the quality of 12 courses, although relatively expeditious, required an intensive effort. The amount of material covered is quite extensive, and the review time and deliberation on the part of panelists can therefore be a costly endeavor. Panelists reported that they spent roughly 1.5 to 2 days per course completing a review, including reviewing course materials online and offline, assessing the course by using the rubric, writing comments, and conferring with partners. This level of effort presents a cost consideration for VHS, or for other projects if they choose to adapt the process to new settings.

The online medium provides a unique evaluative opportunity. Because the Internet allows all interactions to be saved, panelists had the luxury of looking at a class from start to finish, peering in on a single lesson or concept and following each of its developments and online discussions as the course progressed. The availability of the interactions and dialogues, the ability to jump forward to see how the course concludes and then jump back again to see how expectations were initially set, provides rich evaluative opportunities. Reviewing a face-to-face course post hoc would not provide for the same level of scrutiny into interactions and iterative development of assignments and ideas. Through the technology, it is all captured and archived, and a wealth of material can be examined within a relatively compressed time frame (as opposed to actually dropping in, literally, on a face-to-face course and covering only what was observed over the same 1.5 to 2 days). Because of these opportunities, VHS courses may well be more thoroughly reviewed and evaluated than typical face-to-face high school courses.

The review process, including the standards developed by the panel, holds promise in other contexts. During the past decade, a great deal of effort has been expended developing and implementing standards for elementary and secondary education. The great majority of these efforts (whether for curriculum, instruction, or assessment) have focused on particular school subjects—ranging from mathematics to music to geography. Many fewer attempts have been made to formulate standards that apply across disciplines. It seems noteworthy that the panel was able to develop a consensus around standards that are *not* discipline based and to do so quite quickly. Although the panel’s standards by their nature cannot replace disciplinary-based standards, it may be that other groups, such as course-credit-granting agencies, would find this set of quality standards useful for certain purposes. Possibly, other Technology Innovation Challenge Grant projects might be able to apply a similar process, whereby independent experts review course offerings or other products of the grant against a set of quality standards. In other settings, these particular standards are likely to need some adjustments.

The expert panel was impressed with the VHS project. The expert panel was enthusiastic about the potential of the medium and impressed with all that VHS has been able to accomplish with it. In a separate statement written by its members (and bound in this report), the panel has expressed its enthusiasm about the Virtual High School project with the following remarks:

The panel applauds the efforts of teachers and students who are pioneers in developing courses on the Internet that are challenging, interesting, and relevant. We see the project as beneficial in improving education by offering opportunities for a varied curriculum in schools with limited ability to do so. We hope that VHS will continue to grow and reach an even more diverse audience of schools and students. For members of the panel, this has been a very worthwhile experience and we look forward to hearing more about VHS in the future.

It is significant that a group of disciplinary experts, having limited experience with online education, would spend a combined time of many person-weeks examining the VHS courses in depth and conclude with such statements.

APPENDIX A
Biographies of Panelists

Appendix A BIOGRAPHIES OF PANELISTS

Steven Meiring has been the Ohio State Mathematics Supervisor for 25 years. He has expertise in both mathematics and science education and is also an expert in one form of distance learning for K-12 students: television. Meiring has been active in the National Council of Teachers of Mathematics—for example, he is the lead author of one of the Addenda publications that supplement the NCTM standards (*A Core Curriculum—Making Mathematics Count for Everyone: Addenda Series, Grades 9-12*). He has been a leader in many major mathematics and science education reform efforts, such as Ohio’s Statewide Systemic Initiatives project.

Michael Padilla is a professor at the University of Georgia. He contributed to the development of national science education standards and was the principal investigator on Georgia’s Statewide Systemic Initiatives (SSI) project. With his SSI colleagues, he developed an influential document for the state called the *Georgia Framework for Learning Mathematics and Science*. Padilla, a former chair of the Department of Science Education, has worked closely for years with the Georgia Department of Education.

Joanne Grenier is the Curriculum Content Specialist for Integrated History/Social Science and English/Language Arts at the Massachusetts Department of Education. She has worked closely with staff in the state’s high schools reviewing the courses that they offer and considering their alignment with the state’s curriculum standards. Grenier, an Education Reform Teacher Fellow, has helped develop the state’s history and social science assessment test.

Leo West is a Past President of the Pennsylvania Council for the Social Studies and of the East Allegheny Education Association. He chaired a high school social studies department for 24 years in Pittsburgh and is an author of an Advanced Placement European History software package. West has published many columns and articles and has served as a curriculum consultant in social studies.

Kathleen Fulton is currently the Associate Director at the Center for Learning and Educational Technology, University of Maryland. She has extensive experience working with educators in a variety of school districts (including Baltimore and Prince George’s County, Maryland) to align instructional materials with content standards in language arts, social studies, and science. She also has experience evaluating the uses of technology in education. Fulton has worked with the International Society for Technology in Education (ISTE) in developing and teaching an online course for Milken Educators (*Tracking Results: Technology Standards Development and Use*). She holds a bachelor’s degree in English from Smith College.

Linda Mayfield is the immediate Past President of the Virginia Association of Teachers of English. She helped to develop Virginia's English/Language Arts standards and has extensive experience teaching a variety of English courses (from AP to journalism) over the last 25 years. Mayfield currently chairs the English/Language Arts department in an inner-city high school in Norfolk, Virginia.

APPENDIX B
Proposed VHS Standards of Quality – DRAFT, 6/8/99

Appendix B
PROPOSED VHS STANDARDS OF QUALITY – DRAFT, 6/8/99

I. Overall Assessment of the Course

- 1 – The quality of this course appears to be high.
- 2 – The quality of this course appears to be satisfactory but certain questions or issues need to be addressed.
- 3 – There are serious concerns about the quality of this course.

Summary Comments

Panel members will provide summary comments. (In which areas should panel members provide commentary about each course that is reviewed? E.g., difficulty level/rigor? Potential audience? Concerns, if any are raised?)

II. Detailed Assessment

To make an overall judgement about the quality of the course, panel members will make a more detailed assessment of courses against specific quality standards, on several dimensions, such as:

Curriculum/Content

The course facilitates learning about important information, skills, major ideas, and habits of mind in the field being studied.

The course is designed so that students will demonstrate comprehension of important ideas (e.g., by describing, summarizing, interpreting, discussing, or extending facts and ideas presented in the course).

The course is designed to promote critical thinking skills (e.g., students apply their new knowledge, analyze new situations, use old ideas to create new ones, make conjectures, relate knowledge from several areas, etc.).

The materials, activities, and assignments are well matched to the capabilities of students in the grade level(s) and with the prerequisites specified for the course.

All required course materials are made available to students.

The course description is accurate and understandable to prospective students and other interested parties.

Any controversial issues or materials are treated in a responsible manner.

Assessment of Students' Work

The course schedule includes a listing of students' required assignments.

The teacher clearly identifies performance objectives for students that will be used to assess their work in the course.

Assessments are made based on multiple indicators of students' learning.

Pedagogy

The course encourages an active approach to learning the subject, including interaction with the teacher and with other students.

The course makes effective use of the Internet; for example, the teacher is online very frequently interacting with students and the course is structured so that students are also expected to be “present” frequently.

APPENDIX C
VHS Course Standards Rubric (Revised)

Appendix C
VHS COURSE STANDARDS RUBRIC (REVISED)

Course Title _____ Date _____ Reviewer Name _____

Overall Assessment – Circle the appropriate number The overall quality of this course appears to be:	Of serious concern 1	Satisfactory, but certain questions or issues need to be answered 2	High 3
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Strengths/Weaknesses/Comments

VHS COURSE STANDARDS RUBRIC (REVISED) (continued)

Detailed Assessment – To what extent are the following indicators evident in this Netcourse?						
Circle the most appropriate response. "1" indicates the standard is "Not Evident," a "4" indicates the standard is "Exemplary," etc.						
Standard	Not Evident 1	Somewhat Evident 2	Clearly Evident 3	Exemplary 4	Not Applicable 0	Example
Curriculum/Content						
1. The course facilitates learning about important information, skills, and major ideas from multiple viewpoints.	1	2	3	4	0	Major facts and ideas are taught.
2. The course models and emphasizes skills, tools, abilities, values and habits of mind in the field being studied.	1	2	3	4	0	E.g., in a history course students might learn to use primary sources and timelines, and to judge events in historical context.
3. The course provides a considered treatment of breadth and depth.	1	2	3	4	0	Students will learn both a general understanding of the discipline as well as greater depth of comprehension about selected ideas and issues within the subject.
4. The course is designed so that students demonstrate comprehension of important ideas.	1	2	3	4	0	Describing, summarizing, interpreting, discussing, or extending fact and ideas presented in the course.
5. The course is designed to infuse critical thinking and problem solving.	1	2	3	4	0	Students apply new knowledge, analyze new situations, relate knowledge from several areas, create new ideas from old ones, etc.
6. The materials, activities, and assignments are well matched to the capabilities of students in the grade level(s); prerequisites are specified.	1	2	3	4	0	The difficulty level indicated in the course catalog matches the actual nature of the required work.
7. The course description is accurate and understandable to prospective students and other interested parties.	1	2	3	4	0	The course catalog description is accurate and complete.
8. Any controversial issues or materials are treated in a responsible manner.	1	2	3	4	0	Teachers don't confuse fact, theory, and opinion. Reasonable alternative viewpoints are not discouraged.
<i>Strengths/Weaknesses/Comments</i>						

Appendix C
VHS COURSE STANDARDS RUBRIC (REVISED) (continued)

Standard	Not Evident 1	Somewhat Evident 2	Clearly Evident 3	Exemplary 4	Not Applicable 0	Example
Pedagogy						
9. The course encourages an active approach to learning the subject, including interaction with the teacher and with other students.	1	2	3	4	0	Students are asked to do more than complete assignments and submit them to the teacher.
10. The course helps students make effective use of the medium.	1	2	3	4	0	The teacher is interacting online frequently; students are expected to be "present" frequently.
11. The course integrates multiple methods of instruction.	1	2	3	4	0	Examples include assigned reading, discussions, simulation, laboratories, assigned writing, critiques, peer review, presentations.
12. The course orchestrates discourse and collaboration among students within an environment in which multiple viewpoints/values are acknowledged and critically analyzed.	1	2	3	4	0	Students are encouraged to be active course participants; some assignments encourage collaboration; the teacher uses his or her "voice" appropriately; students feel safe expressing their opinions.
<i>Strengths/Weaknesses/Comments</i>						

Appendix C
VHS COURSE STANDARDS RUBRIC (REVISED) (continued)

Standard	Not Evident 1	Somewhat Evident 2	Clearly Evident 3	Exemplary 4	Not Applicable 0	<i>Example</i>
Course Design						
13. The course is structured in such a way that organization of course and use of medium are adequately explained and accommodating to needs of students.	1	2	3	4	0	Instructions take into account varied levels of familiarity with the technology.
14. All required course materials are made available to students.	1	2	3	4	0	Materials are sent to students or are made available to them on the Web.
15. The course schedule includes a listing of high-quality assignments that relate well to course objectives and activities.	1	2	3	4	0	Assignments are clearly listed with expected due dates.
16. The structure of the course encourages regular feedback.	1	2	3	4	0	Students receive regular feedback on their work.
17. The teacher clearly identifies performance objectives for students that will be used to assess their work in the course.	1	2	3	4	0	The teacher makes clear what constitutes success and how grades will be assigned.
<i>Strengths/Weaknesses/Comments</i>						

Appendix C
VHS COURSE STANDARDS RUBRIC (REVISED) (concluded)

Standard	Not Evident 1	Somewhat Evident 2	Clearly Evident 3	Exemplary 4	Not Applicable 0	<i>Example</i>
Assessment of Students' Work						
18. Assessments are based on multiple indicators, which reflect multiple dimensions of students' learning.	1	2	3	4	0	Grades are based on more than a handful of assignments.
19. The course appropriately guides students toward reflection their own learning.	1	2	3	4	0	Students are asked to evaluate their work.
<i>Strengths/Weaknesses/Comments</i>						

Appendix D
VHS COURSE SELECTION

	Course Name	Originating School	Subject Area
✓*	AP English: A Web Based College Level Course in Literature and Composition <i>[WebQuest: A Literary Odyssey]</i>	Forks HS, Forks, WA	LA
✓*	The Folklore and Literature of Myth, Magic and Ritual	Shrewsbury HS, Shrewsbury, MA	LA
✓	Poetics and Poetry for Publication	John F. Kennedy HS, Fremont, CA	LA
✓*	Regional Literature of the U.S. (<i>Exploring America Through Its Writers</i>)	Windsor HS, Windsor, CA	LA
✓*	Writing Through Hypertext <i>[Web Writing]</i>	Las Lomas HS, Walnut Creek, CA	LA
✓*	AP Statistics	Collingswood HS, Collingswood, NJ	M
✓*	Informal Geometry: A Construction Approach	Lumberton Senior High, Concord, MA	M
✓*	The Bioethics Symposium	Hoover HS, North Canton, OH; Wickliffe HS, Wickliffe, OH; Westborough HS, Westborough, MA	Sci
✓	Current Issues in Nutrition and Health	Framingham (MA) State College	Sci
✓	Earth 2525: A Time Traveler's Guide to Planet Earth	Allen HS, Allen, TX	Sci
✓*	Integrated Ecospheric Systems <i>[Environmental Ethics]</i>	Myers Park HS, Charlotte, NC	Sci
✓*	Intro to Microbiology	Center HS, Center, CO	Sci
✓*	Intro to Stellar Astronomy <i>[Astronomy: Stars and the Cosmos]</i>	Hudson HS, Hudson, MA	Sci
✓*	A Model United Nations Simulation Using the Internet	Algonquin HS, Northborough, MA	SS
✓*	Eastern and Western Thought – A Comparison	Campolindo HS, Moraga, CA	SS
✓	The Native American Experience <i>[Native America]</i>	Marlborough HS, Marlborough, MA	SS
✓*	Russian, Soviet, and Post-Soviet Studies	Miramonte HS, Orinda, CA	SS
✓*	Washington, D.C.: American National Government and Politics Simulation (<i>U.S. Government Issues</i>)	Escalante HS, Tierra Amarilla, NM	SS

- ✓ = Found in 98-99 catalogue
* = Also found in 99-00 catalogue

Key:	
A = Arts	SS = Social Sciences
FL = Foreign Language	Sci = Science
Interd = Inter-disciplinary	M = Math
Tech = Technical	LA = Language Arts

Appendix D
VHS COURSE SELECTION (concluded)

	Course Name	Originating School	Subject Area
X	Music Appreciation and Composition	Westborough HS, Westborough, MA	A
X	La Connection Francophone	Acalanes HS, Lafayette, CA	FL
X	Business in the 21st Century	Northampton HS, Gaston, NC	Interd
X	Explorando Varios Aspectos de Culturas Hispanas Atraves del Internet	Allen HS, Allen, TX	SS/FL
X	Computer Technology I	New Hanover HS, Wilmington, NC	Tech
X	Intro to Computer Programming	Hillside HS, Hudson, NC	Tech
X	Writing: From Inner Space to Cyber Space	Rutgers Preparatory Upper School, Somerset, NJ	LA
X	Creative Problem Solving in Math and Logic	Hudson HS, Hudson, MA	M
X	Global Lab	Mendocino HS, Mendocino, CA; Strath Haven HS, Wallingford, PA	Sci
X	Hands-On Physics	Concord Consortium, Concord, MA	Sci
X	Space-Based Astronomy	Keystone Oaks HS, Pittsburgh, PA	Sci

- ✓ = Found in 98-99 catalogue
- * = Also found in 99-00 catalogue
- X = Eliminated (does not fall in core subject matter areas OR was not continued in 98-99)

Key:	
A = Arts	SS = Social Sciences
FL = Foreign Language	Sci = Science
Interd = Inter-disciplinary	M = Math
Tech = Technical	LA = Language Arts

APPENDIX E
Examples of Reviewers' Comments, by Course

Appendix E
EXAMPLES OF REVIEWERS' COMMENTS, BY COURSE

<i>Course</i>	<i>Overall Rating</i>		<i>Weaknesses</i>
M/S	2	<p>Reviewer 1: "Very solid foundation" "Comprehensive treatment overall organization" "Immense amount of work" Instructor's enthusiasm appears to be motivational and inspiring for students, e.g., "variety, humor, color...multiple perspectives,</p> <p>Reviewer 2: Readings were impressive in variety. "Well-organized and easy to follow"</p>	<p>Reviewer 1: More guided learning and assessment, including more collaborative work and opportunities for interaction with students and of hands-on investigations" "Enhance of learning" "Loosen the tight structure of the course to give students more options</p> <p>Reviewer 2: "Lack of laboratory assignments" "Little evidence of systematic feedback"</p>
M/S Course B		<p>Reviewer 1: "Solid course, thoughtfully conceptualized and well designed in its features."</p> <p>students are made to think critically while using inquiry methods of cross-disciplinary experience"</p> <p>apply learning to the complexity of modern...world"</p> <p>Reviewer 2: "Excellent course"</p> <p>High quality student work was a result of student focus "Teacher to student communication seemed to be working very</p>	<p>Reviewer 1: Seemed to be an unbalance in time and amount of work "Pacing/scheduling"</p> <p>Reviewer 2: "Content background... [on] early tasks was a bit thin" "[Need to] make sure the criteria are specified in the beginning."</p>

Appendix E

Course	Rating	Strengths	
M/S Course C		<p>Reviewer 1: "Web sites consisted of very sophisticated readings" "Lessons had backgrounds over which multiple-</p> <p>Reviewer 2: "Great amount of potential," "Course contains material...rich in nature...interesting to students of this age,"</p> <p>variety...students use different kinds of thinking processes," "Challenged to infer, hypothesize, manipulate</p>	<p>Reviewer 1: "Uneven presentation of reading ability and formality required for study of course material." "A more even presentation...at a group and good models of communication." "Lessons were often cluttered...reading was difficult" "Other lessons were excessively long effectiveness, ease of communication" "Course was not paced for the amount of time required to complete later topics" "A need for...more evidence of an assessment rubric or specifically stated list of performances expected with individual assignments" "limited quality activities were to guide self-assessment or reflection</p> <p>Reviewer 2: "Development at a 'pre-publication' level" "The educational were unclear [as in what to do, who to turn to, evaluations being made]" "Difficult level of material [no prerequisites]" "Complexity of be accomplished"</p>
M/S	2	<p>Reviewer 1: "Very solid, traditional grounding for introductory tasks" "Continuing threads of homework, quizzes, and tests formatted similarly to the [final] exam" "High quality lessons and</p> <p>"Students seemed highly involved" "Content is challenging, motivational" "Integrates use of technology"</p> <p>"Scope...is quite good" "Text corresponding to course is good...communicates appropriate information in an engaging and creative" "Assignments are appropriate to the material...motivating and interesting" "Multiple choice [tests] are</p>	<p>Reviewer 1: "Design concerns such as pacing, lack of consistency in specifying lesson objectives, questions about assessment" "Textbooks course...first third...active teacher presence...second two-thirds...self-study" "Slow return in grading student work" "Little student collaboration internet" "Students did not receive expedient feedback" "No resource materials cited or available (in media center)" "Confusion about</p> <p>Reviewer 2: "[Second half of course is] neither challenging nor motivating" "Teacher is not in front of class, communication is limited" teacher" "Course does not orchestrate discourse and collaboration among students" "Typos in course documents" "How the text and the could be refined and improved...does not seem to be a very rich measure of student understanding" No directions or rules given for</p>

EXAMPLES OF REVIEWERS' COMMENTS, BY COURSE (continued)

<i>Course</i>	<i>Rating</i>	<i>Strengths</i>	
LA Course A	3	<p>Reviewer 1: "Wonderful learning opportunity....in a supportive environment....challenged to apply skills of analysis, creativity, reflection, and abstraction" "Wish I'd had the opportunity to take [the course]" "Careful and thoughtful" "Exemplary skills as a teacher...personal scholarship and expertise...love of this content, enthusiasm for teaching it, and concern for all her students."</p> <p>Reviewer 2: "Overall high quality interdisciplinary course, creatively designed and taught" Dedicated and readily accessible instructor</p>	<p>Reviewer 1: "Depth may be sacrificed....to cover all this material" "Greater student responsibility for leading discussions, presenting reports and teaching to the group, becoming "topic leaders," etc. could [be used]" "Greater use of multimedia materials" "Greater use of teamwork, peer review, and self-reflection among the students"</p> <p>Reviewer 2: "Depth is sacrificed as a result of an extensive breadth" "Rubrics for guiding students toward self-assessment would be helpful"</p>
LA Course B	3	<p>Reviewer 1: "Good selection of readings" "The teacher has presented many thought-provoking questions to focus student attention to key elements of the writings, characterization, plot, and style" Multiple writing forms encouraged</p> <p>Reviewer 2: Both students' and the teacher's voice are expressed frequently and clearly respected. Students frequently access the internet for research as well as interact frequently on-line. "many assignments provided...many grades for assessments"</p>	<p>Reviewer 1: "Greater depth of critique [needed by] more teacher reaction in the discussion section as well as more comments given to students individually" Most work, though wide variety of formats used, were individual, short answer No peer review, group activities</p> <p>Reviewer 2: "The areas of course design and assessment of students' work need more attention"</p>
LA Course C	3	<p>Reviewer 1: "Overall a great course" "Received great feedback and encouragement" "Teacher is responsive to students" "Great interaction between teacher and students" "Teacher was very responsive...graded things right away" "Encouraged to write" "[Encouraged] to tie this course to other courses" Teacher dealt with privacy and personal nature of [poetry] carefully, handling subjects delicately.</p> <p>Reviewer 2: "Engaging and rigorous assignments" "Will enhance student's performance" Teacher responded to student assignments promptly. "Detailed instructions accompanied all assignments...answers to missed questions...were fully explained" Students were sensitively challenged and supported.</p>	<p>Reviewer 1: "There could be more interaction encouraged between students" "No team projects or group activities" Directed interaction wasn't seen as part of assignments. "It would have been nice to use more multimedia resources" "Perhaps the anonymity of non-face to face communication helped students feel comfortable with their [writing]?" "Students weren't asked to seek their own sites, or to evaluate the sites they were given" "Better specification could have been given on how assignments were to be graded...rubrics and standards applied" "No clear guidance on reflective thinking or self-evaluation"</p> <p>Reviewer 2: "Didn't find evidence of opportunities for [writing] beyond the VHS classroom"</p>

Appendix E
 EXAMPLES OF REVIEWERS' COMMENTS, BY COURSE (continued)

Course	Overall Rating	Strengths	Weaknesses
LA Course D	3	<p>Reviewer 1: "A real model for other VHS courses" "I want to take this course!" "Careful organization of the class" "Students taken step by step...told what to expect...where to find things...how to do what was expected of them" "Encourage students to work collaboratively [and to] interact" "Students learn by doing" Good design is modeled in course structure. "A variety of assignments, readings, and activities are used" "Reflection is integrated throughout course"</p> <p>Reviewer 2: "Powerful course...challenges students...enhances communication skills...develops technological [abilities]" "Clear and thorough directions" "Requires students to employ higher level critical thinking skills"</p>	<p>Reviewer 1: "Writing instruction...was weak" "Focus was not [on] developing expertise in writing style."</p> <p>Reviewer 2: Non mentioned.</p>
SS Course A	3	<p>Reviewer 1: "Wide range of materials" High expectations communicated clearly Continuous reinforcement through ongoing feedback Teacher seen as facilitator, interaction encouraged, peer reviews used, involvement in refinement of the course, etc.</p> <p>Reviewer 2: "Rigorous challenging course...using diverse skills and tools of learning...addressing a variety of learning styles" Students informed early on of expectations for objectives, progress and quality of work. "Controversial issues handled well" "Assignments are challenging but reasonable"</p>	<p>Reviewer 1: There was one map assignment early in the course that was confusing as to exactly what the assignment was. "[This could be] frustrating to the student at an early stage, especially if their technology skills are at the novice stage."</p> <p>Reviewer 2: "Very little opportunity to develop geographic skills"</p>

Appendix E
 EXAMPLES OF REVIEWERS' COMMENTS, BY COURSE (continued)

Course	Overall Rating	Strengths	Weaknesses
SS Course B	2	<p>Reviewer 1: "Impressive array of materials, both electronic and print" Excellent interdisciplinary, multi-media set of resources (art, literature, museums, historical sites, videos, news media) on the web. Clear identification of objectives and grading policy</p> <p>Reviewer 2: "High quality" "Challenging course" Involves multitude of skills, tools, activities, disciplines. Fosters independence and collaboration, etc.</p>	<p>Reviewer 1: Students dropped out or completed assignments minimally or haphazardly. Minimal student collaboration—most were individual assignments. Very little feedback to elicit refinement to work. "Feedback was generally terse." Interaction was limited to one on one. "Rubrics might help set standards for written products and to give guidelines for specific assignments." "Individual assignments, topics, readings, etc. were very difficult to discern visually"</p> <p>Reviewer 2: "Student records suggest a problem" "Some [students] are either not prepared for the rigor of the course, not mature enough to handle it, or perhaps had technological problems" "Rubric" for assignments could be established so students have guidelines for submissions, e.g., "Meets deadline, addresses question, completes sentences, accuracy (spelling/grammar, reporting information, use of vocabulary, chronology), supports statements w/ evidence."</p>
SS Course C	3/2	<p>Reviewer 1: "Excellent opportunity to research current issues" Technology was utilized- "Important to students as future citizens" "Supportive...encouraging interaction [between students and teacher]" "Thoughtful reflective thinking...learning to analyze issues, weigh evidence and present an opinion" Students were online daily. "Tasks are well defined... encouraged to 'be accurate, balanced, and credit sources'" "Materials represent more than one point of view" "Excellent course, well designed with rigorous content, solid assessment, and good instructional strategies" "Thoughtful, warm, inviting atmosphere...viewpoints were deepened and considered thoughtfully" Deadlines had the effect of students completing course with high quality work. "Strong course for developing student's abilities to reflect on their own learning and to evaluate their work"</p> <p>Reviewer 2: "Links students to sophisticated web sites pertaining to [subject]" "Encouraged to analyze and take a position on a variety of issues" "Positive feedback" "Reprimands for poor work are gentle but to the point" "Controversial matters are treated in a responsible manner" Students form teams, share ideas, and evaluate one another</p>	<p>Reviewer 1: "Appears to be no introductory material or guidelines...to think through and evaluate information" "Students don't necessarily all come...with the same level of critical thinking or innate sensors for determining validity or bias of the material or the author" "Reading assignments...all by the same author" "Instructions and comments...contained misspellings and grammatical errors" "Seemed to tolerate [grammatical errors] from students...presentation of unpolished work"</p> <p>Reviewer 2: "Communication skills ignored" "Instructions and feedback comments [have substantial] spelling and grammatical errors." "[Students] may suffer from grade inflation...assignments are given high marks [despite] typos, grammatical errors and lack of sentences" "Assessments focus on content and neglect communication skills"</p>

Appendix E
 EXAMPLES OF REVIEWERS' COMMENTS, BY COURSE (concluded)

<i>Course</i>	<i>Overall Rating</i>	<i>Strengths</i>	<i>Weaknesses</i>
SS Course D	2	<p>Reviewer 1: "Structure of the course....comprehensive" "Opportunity to build skills" Clear standards for quality written work modeled. "Very structured program" "Students learn the skills, tools, abilities, and habits of mind of [subject]" "Standards and expectations for work are high" Originality highly valued</p> <p>Reviewer 2: "Challenging interactive course" "Promotes excellence"... "Interaction"... "Enthusiasm" "Promoting improvement and augmenting the desire to excel" Students engage in many different forms of writing "Performance standards are clearly stated along with the grading policy" "Daily feedback...assessment is ongoing"</p>	<p>Reviewer 1: "Interaction appears unstructured" "There could be more peer review, response, and critique, required in the assignments" "No material in the media room" "All assignments...came from workbooks...with a few...using Internet" "May be creative ways to make better use of...cyberspace" Most tasks were "paper and pencil" assignments</p> <p>Reviewer 2: "Lack of URLs in the media center" "Missing are cartoons. . . opposing view points" "Extensive interaction with the Web does not seem present"</p>