DOCUMENT RESUME

ED 449 072 SO 032 429

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TITLE Applications of Information Technology for Standards-Based Reform in the United States of America: Their Implications for the Discovering Democracy Program in Australia.

PUB DATE 2000-11-00

NOTE 28p.; Paper presented at the Conference of the New Zealand Association for Research in Education (Hamilton, New Zealand, November 30-December 3, 2000). Contributions to paper provided by Noel Simpson, Declan O'Connell, Robert Moore, Kay Wideman, Heidi McGinley, Michael Tillman, Christine Jax, Patricia Webster, Richard La Pointe, Jo Lynne DeMary, and Paul Stapleton.

PUB TYPE Reports - Evaluative (142) -- Speeches/Meeting Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS *Academic Standards; Citizenship Education; Civics; Comparative Education; *Curriculum Development; Democracy; Educational Research; Elementary Secondary Education; Foreign Countries; *Information Technology; *National Standards; Program Evaluation; *State Departments of Education

IDENTIFIERS Australia; Prototypes; Web Sites

ABSTRACT

An evaluation of the "Discovering Democracy" program, launched by the Commonwealth government in May 1997 to provide civics and citizenship education in schools across Australia, recommended developing a Web site to disseminate curriculum resources. This paper defines a prototype by examining the features of Web sites established by state education agencies in the United States to promote standards-based reform. After presenting overviews of standards-based reforms, the paper describes, through a series of case studies focusing on particular states, specific applications for jurying and organizing lesson plans, assessment techniques, and curriculum resources. It concludes by assessing the implications of applying each feature to the design of a Web site for the Discovering Democracy program. Appendixes list Web sites relating to the Discovering Democracy program and Web sites and Web-based tools of U.S. state education agencies. (Contains 14 references.) (BT)

Applications of Information Technology for Standards-Based Reform in the United States of America: Their Implications for the Discovering Democracy Program in Australia

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Paper presented at the Conference of the New Zealand Association for Research in Education, University of Waikato, Hamilton, New Zealand, 30 November to 3 December, 2000.

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Acknowledgements

The author wishes to acknowledge the contributions made by the following people in completing this paper. Assistance was provided by Noel Simpson and Declan O'Connell of the Commonwealth Department of Education, Training and Youth Affairs in completing the section on the Discovering Democracy program. Robert Moore and Kay Wideman of the Georgia Department of Education provided information on the standards-based approaches used in Georgia. Heidi McGinley of the Maine Department of Education provided information on the standards-based approaches used in Maine and reviewed parts of the section on Maine. Michael Tillman and Christine Jax of the Minnesota Department of Children, Families and Learning provided information on the standards-based approaches used in Minnesota. Patricia Webster of the New York State Education Department provided information on the standards-based approaches used in New York state. Richard La Pointe, Jo Lynne DeMary and Paul Stapleton of the Virginia Department of Education provided information on the standards-based approaches used in Virginia.

Applications of Information Technology for Standards-Based Reform in the United States of America: Their Implications for the Discovering Democracy Program in Australia

An evaluation of the Discovering Democracy program, launched by the Commonwealth government in May 1997 to provide civics and citizenship education in schools across Australia, recommended developing a web site to disseminate curriculum resources. The purpose of this paper is to define a prototype by examining the features of web sites established by state education agencies in the United States to promote standards-based reform. After presenting overviews of standards-based reforms, specific applications for jurying and organising lesson plans, assessment techniques and curriculum resources are described through a series of case studies focusing on particular states. The paper concludes by assessing the implications of applying each feature to design a web site for the Discovering Democracy program.

The revitalisation of civics and citizenship education in Australian schools has been reported widely in published literature covering a range of aspects (Macintyre, 1995; Print, 1995; Boston, 1996; Pascoe, 1996; Print, 1996). A new program in civics and citizenship education was initiated by Prime Minister Paul Keating, who appointed the three-member Civics Expert Group in June 1994. As a first initiative, ANOP Research Services was commissioned to conduct a study into the Australian community's understanding of civics issues through a qualitative study with 24 focus groups followed by a nationwide survey of 2,500 subjects conducted by telephone. The findings of the survey confirmed that there was a low level of understanding across the community about Australia's system of government, but also identified a high interest and participation in civic activities. On the basis of these findings, together with 180 submissions received in response to the consultation, the Civics Expert Group (1994) recommended that the states and territories should make provision for a sequential program of civics education across the compulsory years of schooling. At the conclusion of a three-month period of review in March 1995, the majority of the 126 submitted responses positively supported the report's recommendations. In June 1995, the Commonwealth government released a full response to the report detailing funding for a program, including the development of curriculum materials by the Curriculum Corporation over a four-year period, provision of professional development for teachers to be undertaken in consultation with the states and territories, a series of initiatives based on the recommendations for higher education, technical and further education, and adult and community education, and initiatives for the wider community, including applicants for Australian citizenship, to be developed by a steering committee.

Following the federal election in March 1996, the new Liberal and National coalition government reviewed the program initiated by the former Labor government, finding that its direction should be focused on teaching an understanding of Australia's system of government and

institutions, and the principles supporting Australian democracy. As a consequence, the Commonwealth Minister for Schools, Vocational Education and Training, Dr David Kemp, published a policy statement in May 1997, which specified content for the new program, to be called Discovering Democracy, as an understanding of the development of liberal and democratic ideas, institutions and laws in other settings as they have influenced Australian developments, the building of institutions and traditions in Australian democracy, the responsibilities of federal, state and local government, the roles of the legislature, executive and judiciary in government, the historical development of the constitution, and the achievements of Australia's leading politicians. The Civics Expert Group, which was renamed the Civics Education Group and increased to five members, was given an enhanced role in advising on civics and citizenship education, approving new curriculum materials, and reporting to the Minister on a regular basis. The four-year program was also extended by one year until 1999-2000, and focused on grades 4 to 10.

Early in 1997, discussions between the Civics Education Group and other consultative groups determined that the curriculum materials should consist of a set of units covering four bands: middle primary; upper primary; lower secondary; and middle secondary. The scope and sequence of the eighteen units across the four bands were organised according to four themes: Who Rules? dealing with sovereignty and citizenship; Law and Rights examining the development and nature of law; the Australian Nation dealing with the constitutional development of Australia; and Citizens and Public Life examining the role of citizens in political and communal life. Since some schools did not have computer hardware, it was decided that the materials should be produced in print format, and to place only extension activities on CD-ROM and the internet. As the disciplinary backgrounds of teachers varied considerably, it was decided that a teacher's reference material should be developed. The writing of the units was undertaken in stages so that members of the Civics Education Group, together with officials from the Curriculum Corporation and the Commonwealth Department of Education, Training and Youth Affairs, had an opportunity to review the progress of the writers in matching the intent of the program. Each unit was also trialed in a variety of settings, including a network of 160 project schools across Australia, from which data on the scope and sequence of the activities were collected by a questionnaire survey. As a result of the analysis of the responses, the majority of the units were revised substantially.

The materials were distributed to every school across Australia according to a four-stage schedule. The initial stage involved distributing copies of a booklet presenting an overview of the program, the ministerial statement of May 1997, a special edition of the Curriculum Corporation's magazine focusing on civics and citizenship education, and a CD-ROM, *One Destiny*, presenting information on Federation in Australia during November 1997. The second stage involved disseminating two multimedia materials, one for the primary level and the other for the secondary level, and the teacher's reference material in November 1998. The third stage involved distributing four sets of readers and a poster presenting a timeline of the growth in Australian democracy to schools in November 1999, whilst a CD-ROM, *Discovering Democracy Electronically*, containing the multimedia materials and the teacher's reference

material, was distributed early in 2000. To support teachers in assessing student achievement against the indicators, the fourth stage involved distributing assessment tasks for each unit during 2000. Implementation of the Discovering Democracy program was facilitated through various strategies, some emanating from the national level, whilst others occurred at the state and territory level. As well as sponsoring two national forums, the Commonwealth Department of Education, Training and Youth Affairs funded several national organisations to support implementation of the Discovering Democracy program. Implementation at the state level involved aligning the Discovering Democracy program to each state's and territory's curriculum, as well as appointing state coordinators to facilitate professional development programs for teachers.

The Commonwealth Department of Education, Employment and Youth Affairs commissioned Erebus Consulting Group to conduct an evaluation of the Discovering Democracy program between September and December of 1999. A nationwide questionnaire survey of over 8,000 teachers in a stratified random sample of 3,526 schools was conducted to identify the nature and extent to which schools were implementing the program, and how effective it was perceived by teachers. Questions specified in an interview schedule, administered to 51 stakeholders, were used to identify issues examined in case studies conducted in 65 schools across Australia, classified according to whether they were undertaking 'leading edge' or 'discrete' implementation, or were not implementing the program. Intended to collect anecdotal information about the schools' experiences in implementing the program, case studies were undertaken through site visits at which each school's principal, curriculum coordinator and teachers involved in implementing the program were interviewed. The data obtained from the evaluation led Erebus Consulting Group (1999) to present 25 recommendations framed according to six terms of reference. First, the program should be funded for a further 3 to 4 years focusing on assessment of student outcomes, and extending the program to grades K to 3, and 11 and 12. Second, a set of objectives should be defined for the next phase of the project, which should focus on consolidating implementation of the program using existing networks and strategies. Third, the Civics Education Group should continue to oversee the program, state coordinators should continue to assist schools in adapting teaching and learning approaches, the relationship between state curricula and the scope and sequence of Discovering Democracy activities should be determined, a strategy should be formulated to raise teacher awareness, and a preservice teacher education program should be funded. Fourth, the means for disseminating curriculum resources should be transferred to a web site, which would harness existing web-based resources. The most important of these web sites are listed in Appendix A. Fifth, professional development should use a networking approach, and include national awards, research into practice and sharing school-based approaches and materials. Sixth, Discovering Democracy activities should be coordinated with national priorities in government policy.

Research Problem

Criticism has been levelled at policy-makers' adherence to the research, development and diffusion model, characterised by the following features, for developing and implementing the

Discovering Democracy materials (Finch, 1999). The ultimate responsibility given to the Civics Education Group for developing and approving the Discovering Democracy materials gave this group a similar status to the academic scholars prominent in the projects of the curriculum reform movement. The important role given to other academics as authors, as well as to commissioned writers in developing the materials, relegated teachers to the role of consumers. The importance given to centrally controlled change through the Curriculum Corporation in the production of materials led to sets of multimedia materials characterised by conventional applications of print and electronic media, more typical of the curriculum reform movement than those required for contemporary curriculum reform.

A key recommendation arising from the evaluation was the need to design a web site capable of disseminating the centrally developed curriculum materials, as well as providing the means for teachers to share locally developed resources. The aim of this paper is to explore the implications of this recommendation by reviewing specific applications provided by particular state education agencies in the United States for jurying and organising lesson plans, assessment techniques and curriculum resources for standards-based reform. Its purpose is to identify common approaches used for jurying lesson plans, assessment techniques and curriculum resources, and common attributes for organising, adding and revising these materials on web sites. The intent of this review is to provide a focus for policy-makers in refining the scope of the proposed web site for the Discovering Democracy program.

Methodology

Case study method was selected as the most appropriate design to describe, interpret and evaluate the applications provided by state education agencies in the United States for jurying and organising lesson plans, assessment techniques and curriculum resources for standards-based reform. Case study method is appropriate to investigate these applications, because it focuses on particular aspects, provides a description of the phenomenon, illuminates the reader's understanding of the phenomenon, and relies on discovering new relationships, concepts, and understanding about the phenomenon through inductive reasoning.

A plan for sampling states applied a non-probability, sampling method referred to as purposive sampling. The use of this sampling method has been justified in case study research, because its intent is to discover and understand what occurs, and to gain insight into the relationships linking occurrences (Lincoln and Guba, 1985; Merriam, 1998). Purposive sampling is based on either initial group or sequential processes. In the initial group process, the researcher selects extreme cases, typical cases, cases showing maximum variation, critical cases, politically important cases, or convenient cases. The sequential process involves theoretical sampling, in which the data determine the selection of the sample.

Sampling cases showing maximum variation was employed in this study in order to document unique variations that have emerged in adapting applications of information technology to different conditions. Using documentation compiled on standards-based reform in the United

States for another study as an information base, the author identified that state education agencies in Colorado, Florida, Georgia, Louisiana, Maine, Minnesota, New York, North Carolina, Oregon, Utah, Virginia and West Virginia have developed web-based tools for standards-based education. However, the tools developed by state education agencies in Florida, North Carolina, Oregon and Utah were excluded from the sample, as they were not designed primarily as collections of lesson plans, assessment techniques and curriculum resources. Web addresses of state education agencies included in the sample and their web-based tools are listed in Appendix B.

Several methods were employed to collect data on state-level standards-based reforms in the United States for the original study. First, the target population of 50 state education agencies was surveyed over two stages. The survey was initiated by designing a pro forma letter, sent to each chief state school officer in September 1997, requesting copies of documents relating to standards-based reform. Prior to the despatch of the survey materials for the second stage in February 1998, responses were received from 21 agencies. The second stage involved categorising the agencies comprising the target population according to whether they had, or had not, responded to the initial letter. For those agencies that had responded, letters referring to specific aspects relating to standards-based reform were directed to designated contact officers. For those agencies that had not responded, a checklist was designed covering eight major aspects relating to standards-based reform. Copies of the checklist were enclosed with a pro forma letter addressed to the chief state school officer requesting assistance in responding to the survey. Responses were received from 29 agencies. As part of a process to inform chief state school officers about accessing the final report, a pro forma letter sent in August 1999, also included a request for information on further developments. Responses were received from nine agencies.

Second, information for updating state-level standards-based reforms was obtained by accessing Developing Educational Standards, a directory maintained on the web site of the Putnam Valley School District in New York state, which provides access to listed web sites on standards-based reform. Furthermore, searches of the Educational Resources Information Center database were conducted. Also, policy documents collected from state education agencies since 1990 provided a valuable source for information on the historical backgrounds to state-level standards-based reforms.

Data analysis involved reading all relevant documents and preparing summaries. The information for each of these summaries was then organised chronologically, and incorporated into a state profile. Each state profile was updated periodically from information obtained by accessing the state education agency's web site.

Context and Transactions of the Application of Information Technology for Standards-Based Reform

Following an introductory statement on standards-based reform in the United States, the case

study on each state included in the sample consists of two parts. In the first part, background on the state's development and implementation of standards-based reform is outlined. In the second part, the state's web-based tool and its features are described.

Standards-Based Reform in the United States

The release by the National Council of Teachers of Mathematics of national standards for Mathematics in 1989 stimulated other professional associations to lobby the federal government to support similar projects in other subject areas. Responding to this demand, the United States Department of Education funded professional associations in 1992 and 1993 to develop national standards for Science, History, the Arts, Civics and Government, Geography, English Language Arts, and Foreign Languages, whilst other professional associations funded the development of national standards for Social Studies, Economics, Health, and Physical Education independently. Following release of national standards in these subject areas, state education agencies in all states, except Iowa, used these documents to develop state standards through consultative processes involving their communities. The tradition of local control, particularly strong in northeastern and midwestern states, led some of these states to approve model state standards for adaptation by local school districts, or to embrace the concept of voluntary state standards. The stronger tradition of statewide curricula and textbook adoptions led many southeastern, southern and western states to enforce mandatory state standards.

Colorado

In 1993, the Colorado General Assembly enacted House Bill 93-1313 requiring school districts to redesign curriculum, instruction, testing and teacher development around content standards. A nine-member Standards and Assessment Development and Implementation Council was appointed to oversee development of the Colorado Model Content Standards, and the design of the state assessment program. State-level task forces were assigned to each subject area to develop the Colorado Model Content Standards for grades K to 4, 5 to 8, and 9 to 12 in two rounds. The first round, involving the development of content standards for Mathematics, Science, Reading and Writing, Geography, and History, began in October 1993. The second round, involving the development of content standards for Civics, Economics, Music, Physical Education, Visual Arts, and Foreign Language, began in August 1994. The drafts were revised on the basis of responses from public hearings held across Colorado. The Colorado State Board of Education adopted the revised drafts of the Colorado Model Content Standards for the first round for Science in May 1995, Geography and Mathematics in June 1995, Reading and Writing in July 1995, and History in September 1995. For the second round, the State Board adopted the Colorado Model Content Standards for Visual Arts and Music in November 1997, Physical Education and Foreign Language in December 1997, Economics in August 1998, and Civics in September 1998.

Required by law to adopt content standards that met or exceeded the Colorado Model Content Standards for subject areas in the first round by January 1997, and for subject areas in the second

round by January 1999, all school districts were directed to develop and implement content standards by conducting a process involving teachers, parents and community members, before shifting their focus to linking the standards to local curriculum and assessment practices. Initially, the Colorado Department of Education established a Standards Based Education Priority Project Team to coordinate the provision of technical assistance to school districts, but in 1999 formed eight regional service teams, each consisting of consultants responsible for academic standards based in boards of cooperative educational services located at Limon, Denver, La Salle, Colorado Springs, Rangely, Pueblo, Montrose and Alamosa.

To facilitate implementation of the Colorado Model Content Standards, the Department of Education designed the Standards and Assessment Resource Bank, first made available on a CD-ROM in March 1996, but since January 1999 made available on the internet as Standards in Action. As well as providing links to standards-based resources developed by national organisations and states, standards-based resources are collected from Colorado teachers for inclusion on Standards in Action. Teaching units and performance assessments submitted by teachers to the district's curriculum coordinator, district superintendent or board of cooperative educational services' director must be aligned with the Colorado Model Content Standards or locally-developed standards, and comply with specific submission guidelines, including presentation of a cover sheet, self-assessment critique sheets, and a world wide web publishing agreement. District and board of cooperative educational services' staff use a Summary Requirements Checklist to review each submission before sending it to the Department of Education.

Standards in Action provides links to web sites in five areas. Standards provides links to the Colorado Model Content Standards, standards developed by local school districts, resources developed by other agencies for implementing standards, the national content standards, and standards developed by other states and organisations. Curriculum provides links to two types of curriculum resources aligned to specific grade levels and subject areas of the Colorado Model Content Standards. Resources provide links to web sites containing lesson plans. Units present teacher-developed classroom units and assessments developed by Colorado teachers. Assessment provides a database of sample performance assessments developed by Colorado teachers, which are organised by subject area and grade level. Special needs provides resources addressing the special needs of students requiring alternative assessment. School-to-career provides resources addressing work experience.

Georgia

In 1983, Governor Joe Frank Harris appointed the Education Review Committee, which conducted a review of Georgia's education system producing a set of recommendations. The passage of these recommendations through the Georgia General Assembly in April 1985 in the form of the Quality Basic Education Act led to the development of a uniform Quality Core Curriculum, which was adopted by the Georgia State Board of Education in June 1988, and progressively implemented over the subsequent period ending in 1995. The Quality Basic

Education Act requires the Georgia Department of Education to periodically revise and update the Quality Core Curriculum, a task given by Governor Zell Miller in 1995 to the Georgia School Improvement Panel, which surveyed 8,000 teachers about their attitudes concerning the Quality Core Curriculum, finding that 93 percent expressed a desire for revision. The Georgia School Improvement Panel selected 150 educators, parents, business representatives, community members and higher education personnel to serve on subject-based review teams, which consulted national content standards, and standards documents from other states to revise the Quality Core Curriculum at two writing sessions held in the summer and autumn of 1996. In January 1997, a preliminary draft, distributed to school districts on a CD-ROM for review, was revised in July 1997 on the basis of a report compiled from almost 15,000 responses. The revised Quality Core Curriculum, which was approved by the State Board in November 1997, consists of ten subject areas: Agriculture Education; English to Speakers of Other Languages; Fine Arts; Foreign Languages; Health and Physical Education; Language Arts; Mathematics; Science; Social Studies; and Technology and Career Education. In July 1998, the Georgia School Improvement Panel appointed 130 teachers, subject specialists, business and community leaders, and higher education personnel to develop and refine content standards not already addressed by the review teams. These revisions were approved by the State Board in November 1998, and merged into the Quality Core Curriculum.

The revised Quality Core Curriculum was disseminated on the internet and to school districts as a printed document in January 1998 for implementation during the 1998-1999 school year. In January 1998, the Department of Education published an implementation guide, *Raising Expectations*, to facilitate implementation of the Quality Core Curriculum in schools. In February and March of 1998, the Georgia Leadership Academy convened three workshops at Macon, one each for key educators at the elementary, middle and high school levels, on appropriate teaching strategies for implementing the Quality Core Curriculum. Interactive conferences were held at 24 sites across Georgia in February, March and April of 1998 for teachers to exchange ideas about implementing the Quality Core Curriculum. A four-day workshop on curriculum alignment, held at Macon in March 1998 for more than 300 curriculum leaders, was led by two national experts. Regional education service centres located at Dearing, Ellaville, Valdosta, Statesboro, Griffin, Eastman, Atlanta, Fort Valley, Ellijay, Winterville, Rome, Sandersville, Waycross, Cleveland, Pelham and Grantville conducted staff development activities during the summer and autumn of 1998 to help teachers implement the Quality Core Curriculum in their classrooms.

The Department of Education initiated a project in February 1997 to locate, evaluate and link internet-based resources to the Quality Core Curriculum. As demands from teachers for more curriculum resources increased, the Department of Education contracted the Georgia Institute of Technology to design a web site, Georgia Learning Connections. In the summer of 1999, 25 teachers worked as internet linkers, whilst another 75 teachers surfed the world wide web for a week in July 1999 to identify, evaluate and build a collection of 8,000 resources for the Georgia Learning Connections. Each of these teachers served as 'ambassadors' during the 1999-2000 school year to increase local awareness of the Georgia Learning Connections, first made

available on the internet in October 1999. In addition, a collection of educational resources for parents was added in the spring of 2000.

The Georgia Learning Connections contains a searchable database to the Quality Core Curriculum, and a Teacher Resource Centre, providing access to two types of resources. Curriculum Resources link web sites containing lesson plans, student activities and research materials to specific grade levels and subject areas in the Quality Core Curriculum. Educational Resources organise resources under eleven categories. Classroom strategies provide links to web sites containing information on assessment, classroom management, and technology integration. Exceptional student resources provide links to web sites containing information on physical, intellectual and emotional disorders. Fairs and contests organise fairs and contests by subject areas. Georgia treasures provide links to web sites containing information on Georgia resources categorised into general, government agencies, historical figures, historical sites, libraries, museums, and parks. Information literacy provides links to web sites focusing on information literacy. Lesson plan collections provide links to web sites offering collections of lesson plans organised by subject areas. Libraries and museums provide links to web sites of libraries and museums. Professional resources provide links to web sites offering information on conferences, grants and professional development, as well as web sites of professional associations. References and periodicals provide links to web sites offering on-line dictionaries, encyclopedias, general resources, journals, magazines, maps and newspapers. Teacher tools provide links to guides on the Georgia Learning Connections, on-line resources for classroom management, and software resources. Teacher treasures provide links to web sites offering educational resources for teachers. Themes and topics provide links to web sites presenting information on themes and topics organised into four levels: grades K to 2; grades 3 to 5; grades 6 to 8; and grades 9 to 12.

Louisiana

Reform of mathematics and science education was initiated through the Louisiana Systemic Initiatives Program, funded by a grant obtained from the National Science Foundation in 1990. A panel, appointed to develop Mathematics and Science frameworks, divided into two sub-panels, each consisting of state officials, teachers, educators working with special needs and ethnic groups, and teachers from institutions of higher education. After assessing current needs in Louisiana, the Mathematics sub-panel developed a strategic plan, and divided into two committees, one of which developed content standards, whilst the other wrote grade-level handbooks. Once the draft was completed, it was submitted for review by state education leaders and national experts in curriculum reform. The drafts of the handbooks were reviewed by classroom teachers across Louisiana. Louisiana Content Standards for Mathematics were adopted by the Louisiana State Board of Elementary and Secondary Education in April 1996. A State Content Standards Task Force, consisting of teachers, principals, subject supervisors, representatives from business and higher education, assessment specialists, parents, and students, was appointed to oversee the development of content standards in the Arts, English Language Arts, Foreign Language, and Social Studies. Content area teams, consisting of teachers

from across Louisiana, were formed to develop the drafts, which were completed in May 1996. The drafts were then presented to leaders from school districts for consultation in December 1996, before being reviewed by school districts. Following completion of the review process in March 1997, the drafts were revised before being presented to the State Board for review and adoption in May 1997.

In 1999, the Louisiana Department of Education appointed planning and development teams to oversee the establishment of a web site, Making Connections. Teams of teachers collected lesson plans developed by Louisiana teachers, identified web sites, reviewed software products and gathered assessment items, and linked these resources to the Louisiana Content Standards.

Lesson plans, submitted by Louisiana teachers, are evaluated by the planning and development teams using a Making Connections Lesson Plan Rubric consisting of sets of criteria referring to content, procedures and activities, technology integration, evaluation, and overall instructional design. If any aspect is found not to meet a desired level, a teacher is given the opportunity to revise and resubmit the lesson plan. The planning and development teams use a Making Connections Web Site Preview Rubric to evaluate previews of web sites according to sets of criteria referring to content, accuracy, and technical aspects. Software products, which are previewed by Louisiana teachers at software preview centres in each of the state's eight regions, are also available for examination at the software collection housed in the Louisiana Center for Educational Technology at Baton Rouge. Teachers use a Making Connections Software Preview Rubric to evaluate previews of software products according to sets of criteria referring to content, accuracy, and technical aspects.

Making Connections is a searchable database of lesson plans, web site resources, software products, and assessment items. Each lesson plan is organised under sixteen descriptors: primary subject area; grade level; overview; approximate duration; Louisiana framework; technology strategies; interdisciplinary connections; objectives; materials; technology connection; background information; lesson procedures; reproducible materials; assessment procedures; exploration and extension; and resources. The collection of web sites is intended to be integrated into teachers' daily lesson plans and used by students to achieve the objectives of particular lessons. As well as providing a link, information is presented on each web site under seven descriptors: primary subject area; grade level; description; copyright or last update date; content standard comments; special need comments; and technical comments. Information is presented on each software product under five descriptors: system requirements; primary subject area; focus; software type; description; and publisher. The collection of sample assessment items is available to familiarise students with standardised test items that require the use of problem-solving and critical thinking skills.

Maine

Following enactment of the Education Reform Act of 1984, Maine schools undertook a wide variety of initiatives, which informed the development of seven goals for education. Beginning

in September 1989, a series of meetings and regional forums was convened at which Maine citizens developed the seven goals as a plan of action for the 1990s. In order to address Goal 1, the Commission on Maine's Common Core of Learning, formed by Governor John McKernan in February 1989, developed a draft outlining a broad vision of what education should be like to prepare students for the twenty-first century. The draft was presented at eight forums for public review in November 1989, before being revised and distributed to schools in 1990. In 1993, the Maine Legislature directed the Maine State Board of Education to establish a 33-member Task Force on Learning Results, which developed goals and standards for student performance, and recommended a plan for achieving them. Following presentation of the Task Force's report in January 1996, the Legislature approved six guiding principles, and required the Maine Department of Education to develop Learning Results. As a consequence, the 22-member Critical Review Committee was appointed in July 1996 to prepare a draft, which was distributed to educators for consultation, and then revised on the basis of responses. The State Board and the Department of Education held a series of public hearings on the revised draft in January 1997, prior to its final revision and subsequent approval by the Maine Legislature in May 1997.

The Learning Results present guiding principles, describing the characteristics of a well-educated person, and organise content standards and performance indicators for grades pre-K to 2, 3 to 4, 5 to 8, and the secondary level in eight subject areas: Career Preparation; English Language Arts; Health and Physical Education; Mathematics; Modern and Classical Languages; Science and Technology; Social Studies; and Visual and Performing Arts. Commencing in the 1997-1998 school year, the Learning Results Steering Committee coordinated implementation of the Learning Results over a five-year period. Implementation was undertaken by a Learning Results Team, which provided information, structures, processes and materials for school districts, whilst a nine-member Regional Educational Services Team offered assistance to school districts across Maine's nine regions. The Department of Education trained district personnel to use protocols for linking local standards and assessments to the Learning Results and the Maine Educational Assessment. The protocols employ a three-stage process: pre-linking preparation, in which the subject area, elements to be aligned, appropriate documents, personnel and template are identified; the linking meeting, at which the group reviews the documents, individually completes the template, reaches a consensus about the link, and identifies 'fits and gaps'; and post-linking, in which a summary report is prepared, providing the rationale for determining the links, identifying the 'fits and gaps', and presenting a set of decisions to be made after completing the process. A comprehensive planning process, based on the work of Senge et al. (1994), is used to meet the needs of individual students in implementing the Learning Results. A planning team of teachers develops a profile of each student before the commencement of the school year by completing a Personalised Opportunities-to-Learn template, identifying the student's attitudes and beliefs about learning, the physical issues related to the student's learning, and the issues related to the student's learning interactions and style. The planning team then develops an individualised program for the student by adapting the performance indicators to accommodate the student's needs in meeting the guiding principles and content standards. Assessment of the student's progress is determined by applying a tool called Personalised Assessment Choices, which guides the planning team to select appropriate

techniques for assessment (Baker and Gervais, 1997).

Beginning in 1998, the Southern Maine Partnership, a school-university collaborative of 33 school districts and the University of Southern Maine, developed a web site, Electronic Learning Marketplace, providing a searchable database containing teacher-developed lessons, projects and learning activities aligned to the Learning Results. A demonstration site was provided by the Old Orchard Beach School District, and during 1999-2000 more than 200 teachers in Southern Maine Partnership schools were contributing to the Electronic Learning Marketplace. Participating teachers were involved in training programs and workshops on designing and preparing lessons for web publication, participating in peer reviews, and developing lessons published on the web site. The Electronic Learning Marketplace provides an on-line guide based on its training program in which teachers are shown how to produce lessons aligned with the Learning Results. First, students' learning targets are aligned with the Learning Results by using forms to identify standards referring to particular learning and assessment activities, and to define essential learning and assessment targets for a particular lesson. Second, the learning targets are matched to a particular assessment technique by using an Assessment Framework. Third, the quality of a lesson is determined through a tuning protocol, and by using a Quality Indicators Scoring Guide. The tuning protocol involves an hour-long peer review, and the Quality Indicators Scoring Guide is used to judge the quality of the lesson according to criteria of instructional worthiness, content quality and accuracy, alignment, and fairness.

The Electronic Learning Marketplace consists of two collections of teacher-developed lessons, a searchable database of the Learning Results, a guide for developing high quality lessons aligned to standards, a resource area for parents, community members and businesses, a resource area containing various documents relating to standards and assessment, and an assessment area providing a grid of Southern Maine Partnership schools showing assessments in designated subject areas and grade levels. The Take 1 collection of lessons consists of 'snapshots' presenting information about their alignment to the Learning Standards, descriptions of learning activities, and assessment methods. The Take 2 collection, which is organised by subject area and grade level, presents information about their alignment to the Learning Results, a description of what is taught and assessed, examples of student work, reflections on assessment, a teacher developer profile, and references.

Minnesota

The process of defining what students should know at the time of school graduation began in 1987, when the Minnesota State Board of Education formally articulated its intention to develop an outcome-based education system. In 1989, the State Board adopted model learner outcomes to be used as a basis for curriculum development, and essential learner outcomes to be used as a basis for assessment in each subject area. In 1990, the State Board appointed the Graduation Standards Executive Committee, consisting of representatives from education, business and citizen groups, which developed the first drafts of the graduation rules. Following a series of 43 public hearings and meetings held in 1991 to respond to these drafts, the Minnesota Legislature

required the State Board to develop a results-oriented graduation rule, which led to the development of a two-tiered graduation rule in 1993. The process of developing the Minnesota Graduation Standards involved teams of teachers considering various subject areas, the requirements that should be specified and assessments that might be used, the State Board conducting public hearings in the spring of 1994, consultations with the business, military and higher education communities in 1995, and educators developing performance packages at 23 pilot sites across Minnesota. Working at 14 of these pilot sites, teachers developed the High Standards in the Profile of Learning during the 1993-1994 school year, and a sample performance package for each standard, which they piloted in their classrooms. The State Board approved the High Standards in May 1998. Following the formation of a partnership between educators, business and the state government, SciMath developed curriculum frameworks for Science published in 1997, and Mathematics published in 1998, through professional discussions, writing conferences, individual and group reviews and editing sessions. As a result of the collective efforts of teachers from schools and institutions of higher education and consultants from professional associations, the Minnesota Department of Children, Families and Learning developed a People and Cultures curriculum framework, which was published in 1999.

The Minnesota Graduation Standards, which organise content standards as broad descriptions of skills and knowledge, consist of two parts: Basic Standards, relating to basic skills in reading, mathematics and writing assessed in grade 9; and High Standards, which define what students should know, understand and be able to do to demonstrate a high level of achievement, organised into four levels: primary (grades K to 3); intermediate (grades 4 and 5); middle (grades 6 to 8); and high school (grades 9 to 12). The High Standards are organised into the Profile of Learning covering ten learning areas: Arts and Literature; Decision-Making; Inquiry; Mathematical Applications; People and Cultures; Read, Listen and View; Resource Management; Scientific Applications; World Languages; and Write and Speak. Although implementation of the Minnesota Graduation Standards commenced in the 1998-1999 school year, controversy emerged during public debate in 1999 over the Profile of Learning. Whilst conservative groups organised into the Maple River Education Coalition urged replacing it with their North Star Standard, Governor Jesse Ventura and the Department of Children, Families and Learning proposed modifying it by using record-keeping software to reduce paperwork, granting waivers to school districts wishing to experiment with the Profile of Learning, reviewing and clarifying key terms, improving practices for implementation, and establishing a revision process. Polls conducted in April 1999 indicated that a substantial minority of Minnesota voters favoured giving teachers more time to become familiar with the Profile of Learning. The Legislature debated the issue in 1999 with the House passing a bill to replace the Profile of Learning with rigorous academic standards, but rejecting its elimination, whilst the Senate supported a proposal to give school districts the option of reducing the number of required performance packages. In May 2000, both houses of the Legislature compromised by passing modifications to the Profile of Learning allowing school districts to phase in the number of standards required for students to graduate, empowering teachers to participate in these decisions, and removing the requirement to use state and local performance packages.

In 1998, the Department of Children, Families and Learning established the Minnesota Electronic Curriculum Repository, providing a searchable database of curriculum materials aligned to the Minnesota Graduation Standards. Beginning in October 1999, the Department of Children, Families and Learning designed an improved version of the database that allows teachers to customise elements of the collection, and incorporated more recent contributions from teachers.

Teachers may submit assessment tasks, learning activities, and learning resources for inclusion in the Minnesota Electronic Curriculum Repository by completing the appropriate template and submission form on-line. Each content standard for each learning area in the Minnesota Electronic Curriculum Repository contains three templates, one each for assessment tasks, learning activities, and learning resources. Submissions are sent electronically to teachers with expertise in best practice teaching techniques, effective curriculum design and standards-based performance assessment for peer reviews. Each reviewer uses a checklist to assess a submission against six criteria. The submitted material must integrate curriculum, instruction and assessment, require authentic use of knowledge and skills specified in the content standard, include developmentally appropriate tools and strategies, which are fair to all students, require rigorous application and complex integration of knowledge and critical skills, articulate expectations and quality indicators to students, and align the content standard, evidence of learning, feedback tool and scoring criteria. Reviewers recommend submissions for unconditional acceptance, conditional acceptance after editing by the Department of Children, Families and Learning with the author's permission, major revision by the author followed by a second review, or rejection.

The database of the Minnesota Electronic Curriculum Repository organises the content standards of the High Standards into primary, intermediate, middle and high school levels according to learning area in the Profile of Learning. Each content standard consists of five components. Large processes and concepts identify the transferable knowledge and skills inherent in the learning area, and provide a structure for teachers to build curriculum and assessment. Assessment tasks are assignments or applications requiring students to demonstrate achievement against one or more specifications of a content standard. Learning activities support the learning required of a content standard and learning area. Learning resources are any material or community resource, which is related to a learning activity or assessment task, and assists students in their learning. State model performance assessments are examples of possible assessments that can be used to measure student achievement on the High Standards. School districts or individual users can store their own materials on the Minnesota Electronic Curriculum Repository by acquiring an account. Assessment tasks, learning activities, and learning resources stored in such accounts are not accessible publicly, nor subject to peer reviews.

New York

In 1991, the New York State Board of Regents adopted A New Compact of Learning, providing a vision for systemic reform based on six principles: all children can learn; a focus on results; aim

for mastery; provide the means; provide authority with accountability; and reward success and remedy failure. Appointed by the Board of Regents to develop a plan for curriculum reform based on A New Compact of Learning, the 28-member New York State Curriculum and Assessment Council issued an interim report in October 1992 describing a vision for a learning-centred curriculum, recommending that content and performance standards be defined, and set out in curriculum frameworks. In response to public comments to the interim report requesting that implementation of the vision be defined in greater detail, the New York State Curriculum and Assessment Council released a discussion document, outlining a strategy for developing a set of curriculum frameworks and a revised assessment system. Following a series of meetings across New York at which public comments were gathered on the strategy, the New York State Education Department released an overall strategy in the autumn of 1995 consisting of three elements: setting high Learning Standards and revising the assessment system; building the capacity of schools to support student learning; and developing an accountability system. As a consequence, the Board of Regents appointed curriculum and assessment committees to develop curriculum frameworks containing Learning Standards, which organise key ideas and performance indicators or checkpoints, and present samples of student work for seven subject areas: Arts; Career Development and Occupational Studies; English Language Arts; Health, Physical Education, Family and Consumer Sciences; Languages other than English; Mathematics, Science and Technology; and Social Studies. The preliminary drafts were presented for public and expert reviews in 1994 and 1995, revised on the basis of responses, and adopted by the Board of Regents between March and July of 1996. During 1996 and 1997, working groups, consisting of teachers, and staff of the State Education Department and institutions of higher education, developed resource guides, consisting of indicators, examples of evidence of achievement, samples of integrated learning experiences, implementation strategies and suggested resources. The curriculum frameworks and resource guides were disseminated on the internet, and to school districts as printed documents for implementation from 1997.

Local capacity to implement the curriculum frameworks and the state assessment system was extended through the Board of Regents' proposals to focus resources, increase time for professional development resources, provide funds to improve school facilities, introduce a coordinated plan for delivery of professional development services through a range of providers, use publicising materials and teleconferences to reach a wider audience, and publish the *Directory of Innovative School Practices*, identifying schools which had implemented innovative practices. Professional development activities were offered by more than forty providers, including the Staff and Curriculum Development Network, teachers centres, professional associations, as well as bilingual education technical assistance centres, special education training and resource centres and comprehensive school health and wellness centres based in boards of cooperative educational services located at Albany, Auburn, Bath, Binghamton, Broadalbin, Canton, Castleton-on-Hudson, Cheektowaga, Dix Hills, Elmira, Elmsford, Fairport, Fredonia, Goshen, Herkimer, Ithaca, Liberty, Lockport, Malone, Mexico, Mount Morris, Newark, New Hartford, New Paltz, Norwich, Olean, Plattsburgh, Poughkeepsie, Saratoga Springs, Spencerport, Stamford, Syracuse, Verona, Watertown, Westbury, Westhampton Beach, West Haverstraw, and Yorktown Heights. Twelve regional information

centres, computer centres operated by consortia of boards of cooperative educational services, provided consultation and technical assistance, development of curriculum resources and professional development related to the implementation of the Learning Standards.

Both the curriculum frameworks and resource guides are designed to be dynamic, and undergo continuous development on the internet. Teachers are invited to submit learning experiences, which have worked well in their classrooms, for inclusion in future editions of the resource guides. Teachers, who have had their work accepted through peer review, become members of the New York State Academy for Teaching and Learning, established in 1997. Designed in 1996 by consultants from the Annenberg Institute for School Reform based in Brown University at Providence, Rhode Island, the peer review process evolved from 'blind' reviews based on written submissions to teachers meeting with peer reviewers annually in March to assess their learning experiences. Over the course of several sessions held in Albany, the peer review process was refined by more than 650 teachers to become an occasion for professional discussion. In addition, State Education Department consultants were engaged to solicit learning experiences, prepare them before peer reviews, and coach teachers during the peer review process. The hour-long peer review process uses a team of seven to nine reviewers, at least half of whom represent the subject area and level at which the learning experience is taught. The team is led by a facilitator, who may participate actively as a reviewer or simply facilitate the peer review process. Another team member records a summary of the discussion on a Recorder's Form. Each reviewer uses a Criteria for Review Reporting Form to comment on the relation of the learning experience to the Learning Standards, the construction of knowledge, the challenge and engagement for students, the assessment plan, adaptability, integration of technology, value outside school, and presentation. The teacher presents the context for the learning experience, indicates the targeted Learning Standards and performance indicators, and outlines the teacher's and students' roles, the teaching approach, the amount of time required for preparation and presentation, specific assessment techniques, and examples of student work. Each reviewer submits the completed Criteria for Review Reporting Form to the facilitator at the end of the review, so that comments can be incorporated into a report to the teacher.

The web site of the New York State Academy for Teaching and Learning presents information on the peer review process, a database of learning experiences, a set of tools, a news update, and a set of links. The database of learning experiences is organised by subject area into the elementary, intermediate, and commencement levels. Each learning experience is structured into eight components. The learning context describes the purpose, objectives or focus of the learning experience. The procedure describes the actions of the teacher and students during the learning experience. Instructional and environmental modifications describe accommodations for the range of abilities, including those for students with disabilities, limited English proficiency, or bilingual requirements. Time required defines teacher planning time, teaching time, and assessment time. Resources list human and material resources available to support the learning experience. The assessment plan describes the procedures for measuring student achievement of the learning experience. Student work presents student work examples. Reflection presents the teacher developer's comments about the learning experience.

Virginia

The Virginia Board of Education used a process of broad-based consultation in 1981 to develop Standards of Quality, which incorporated Standards of Learning, and subsequently revised them between 1986 and 1988 as a result of a recommendation made by the Commission on Excellence in Education appointed by Governor Gerald Baliles in 1986. In June 1994, the Virginia Department of Education approved a process for refining and revising the Standards of Learning for the core subjects by contracting four school divisions: Fairfax County for Mathematics; Prince William County for Science; Virginia Beach City for English, Reading and Language Arts; and Newport News for Social Studies. Each of these lead divisions identified a consortium of school divisions to assist in the revision process conducted by groups consisting of teachers, curriculum specialists, higher education faculty, parents and representatives from business and industry, professional organisations and special interest groups during the summer of 1994. The revised Standards of Learning were presented to the Board of Education in October 1994 for initial review, prior to public review at ten hearings conducted across Virginia in March 1995. Following revision based on responses, the Standards of Learning for the core subjects were adopted by the Board of Education in June 1995. In September 1998, the Department of Education contracted the College of William and Mary at Williamsburg to assist groups of curriculum specialists and teachers develop Sample Curricula for English, Mathematics, and Science presenting guidelines to assist school divisions develop local curricula. In April 1999, the Board of Education initiated a process to revise the Standards of Learning for the remaining subject areas over two rounds: Dance Arts, Theatre Arts, Music, Visual Arts, and Foreign Language between May 1999 and June 2000; and Health, Physical Education, and Driver Education between May 2000 and June 2001. Consisting of principals, supervisors, teachers, parents, students and representatives of professional associations, writing committees developed drafts for the first round, which were presented to the Board of Education for initial review in January 2000. The Board of Education adopted Standards of Learning for Dance Arts, Theatre Arts, Music, and Visual Arts in May 2000, and Foreign Language in June 2000. Beginning in July 2000, the Standards of Learning for History and the Social Sciences were reviewed and revised by a revision review committee before adoption by the Board of Education in November 2000.

The Standards of Quality require school divisions to implement the Standards of Learning, or standards that are equivalent or exceed the Standards of Learning. In May 1996, the Department of Education held four Standards of Learning 'share fairs' to provide opportunities for educators from all school divisions to participate in seminars on aligning local curricula with the Standards of Learning. In May 1998, the Department of Education introduced the Standards of Learning Training Initiative, for which school divisions were funded to develop and implement local plans incorporating training for teachers and administrators. In June 1998, the Department of Education disseminated a Technical Assistance Resource Document presenting effective staff development models, resource lists for each subject area, guidelines for program design and evaluation, resource lists for professional development of administrators and assessment, and details of training courses offered by institutions of higher education. In July

1998, Governor James Gilmore authorised the foundation of eight Governor's Best Practice Centers at Chesterfield, Newport News, Bowling Green, Winchester, Harrisonburg, Chatham, Marion and Farmville to work with school divisions in their regions to identify a repository of best practices to support the Standards of Learning to be shared with schools.

In October 1998, Virginia's first lady, Roxane Gilmore, launched A Commonwealth of Knowledge, one of several web sites created by the Department of Education to support implementation of the Standards of Learning. Teachers may submit lesson plans to the Commonwealth of Knowledge web site on-line or by copy and paste into a word processing program using a Lesson Plan Template. Submitted into the lesson plan collection electronically, lesson plans are reviewed monthly by Virginia's Teachers of the Year Committee, and official notifications are issued quarterly. If a lesson plan is rejected, comments are issued, and the author may resubmit a revised lesson plan.

The Commonwealth of Knowledge website consists of a searchable database of the Standards of Learning, a collection of lesson plans, a register of volunteers, a bulletin board for news and events, a forum for success stories, a calendar of classes providing a conference schedule, a teacher-to-teacher discussion forum, links to educational web sites, and the First Lady's spotlight tour. Each lesson plan is organised under sixteen descriptors: title; target curriculum; target grade; Standards of Learning; time; objective; purpose; materials; procedure; observations; conclusions; for your information; extension; class discussion questions; cautions and concerns; and comments from the author. The register of volunteers allows teachers and other professionals to volunteer their expertise as guest speakers or as a resource to schools. The bulletin board announces important news and events relating to the Standards of Learning. Teachers may contribute their success stories about implementing the Standards of Learning to an on-line forum. The calendar of classes allows teachers to post information about workshops and conferences. The discussion forum, which allows teachers to exchange ideas, ask questions and share resources with their colleagues, provides a searchable collection of posted messages. Links are provided to web sites of colleges and universities, school divisions, elementary schools, middle schools and high schools across Virginia, as well as to web sites of various organisations providing educational services in the United States. Web addresses, submitted by teachers for inclusion on the list of links, are reviewed before posting. The First Lady's spotlight tour provides an archive of web sites highlighting projects and resources in Virginia. Teachers may submit suggestions for spotlight tours.

West Virginia

In 1996, the West Virginia Legislature passed Senate Bill 300 enacting a package of reforms, including the development of a rigorous curriculum by revising the West Virginia Instructional Goals and Objectives for Driver Education, English Language Arts, Fine Arts, Foreign Language, Health, Mathematics, Physical Education, Science, Social Studies, and Vocational Technical Studies. As a consequence, the West Virginia Board of Education adopted Policy 2520, providing revised West Virginia Instructional Goals and Objectives in the core subject areas for all

programs of study. Revision of the programs of study, which is undertaken on a rotation schedule over a six-year cycle, is conducted by subject-based committees. Elements derived from the national content standards and content standards from other states, were incorporated into the West Virginia Instructional Goals and Objectives during reviews completed in the core subject areas in 1998, and again for English Language Arts and Mathematics in 2000.

The West Virginia Department of Education supported implementation of the West Virginia Instructional Goals and Objectives by creating several web sites in collaboration with other state agencies and private organisations. The Board of Education, the Department of Education, the West Virginia High Technology Consortium Foundation, county boards of education, colleges and universities, Bell Atlantic and West Virginia Public Broadcasting formed a consortium in October 1998 to design the five-year West Virginia TurnKey Solution project, intended to develop Phase 9 training, one of 20 national models for professional development in educational technology. Following completion of preliminary training, each participating teacher joined one of 560 three-member teams, each consisting of teachers from the same school, or two schools in the same county. At a five-day training workshop on creating integrated lesson plans held at the West Virginia High Technology Consortium Foundation's training facility at Fairmont, each team completed two lesson plans linked to the West Virginia Instructional Goals and Objectives. Following approval by a panel of educators, each lesson plan was edited by staff of the West Virginia High Technology Consortium Foundation and posted on a web site, the Solution Site.

The Solution Site contains a searchable database of teacher-developed units organised by subject areas, an area to post comments, an area to post problems, an area for sharing the site, and a production room for developing units. Each teacher-developed unit presents information covering the stage of production, subject, author, a description of the unit, technology tools applied in the unit, grade level, alignment to appropriate national standards, alignment to the West Virginia Instructional Goals and Objectives, search keywords, a lesson plan, and collections. The lesson plan consists of several lessons, each organised under 19 descriptors: title; grade level; subjects; learner outcomes; time frame; materials; technology tool and courseware; teacher notes; procedures; modifications; enrichment activities; evaluations and assessments; West Virginia Instructional Goals and Objectives and other standards; references; comments; created by; date created; date modified; and attachments.

Saliencies

As stated earlier, the purpose of this paper is to identify common approaches for jurying lesson plans, assessment techniques and curriculum resources as a prerequisite for their entry into web-based tools, and common attributes for organising these materials in web-based tools and presenting output reports. In the case of seven of the eight web-based tools studied, a peer review process was used to jury lesson plans, assessment techniques or curriculum resources. Although a database of full-text records constitutes the critical feature of seven of the eight web-based tools studied, the structures of these databases show greater diversity than those of

on-line information retrieval systems. Furthermore, the applications for presenting output reports from these web-based tools show considerable flexibility.

The evidence suggests that as peer review evolves from 'blind' reviews to the participation of developers in the process and eventually to their training, peer review becomes a more important aspect for jurying materials. The peer review process employed by the New York State Academy of Teaching and Learning and the Southern Maine Partnership has its origins in exhibitions of mastery, one of five imperatives recommended by Sizer (1984) for producing better schools. As conceptualised by Sizer, exhibitions are intended to measure students' mastery of knowledge directly through performance in a public setting as a prerequisite for graduation. The Coalition of Essential Schools, formed in 1984 by Brown University and a group of schools, devised exhibitions as a method of assessment. In 1992, five schools participating in the Coalition of Essential Schools' Exhibitions Project developed the tuning protocol as a facilitated process for teachers to receive feedback and refine their exhibitions. The tuning protocol process involves a teacher presenting a sample of student work to a circle of 8 to 12 'critical friends' guided by a facilitator at which exhibitions are refined by 'warm' and 'cool' feedback. For McDonald (1993), supportive responses to exhibitions signify 'warm' approaches, challenging responses signify 'cool' approaches, and standards of validity, reliability and equity constitute 'hard' approaches. As senior researcher with the Coalition of Essential Schools and later as a professor at New York University, McDonald encouraged the incorporation of these concepts as an element of the peer review process designed for the New York State Academy of Teaching and Learning. The involvement of teachers in an extensive training program is an important adaptation made by the Southern Maine Partnership to the tuning protocol process. Although the peer review processes employed for jurying materials for entry into web-based tools used in Colorado, Louisiana, Minnesota, Virginia and West Virginia bear some similarities to those in Maine and New York, the use of 'blind' reviews in each case suggests that the processes did not originate in exhibitions of mastery. As the Georgia Learning Connections do not include lesson plans contributed by Georgia teachers, no form of peer review process is employed.

This examination of web-based tools indicates that the scope for variation in the organisation of lesson plans, assessment techniques and curriculum resources in databases is only limited to particular requirements set by providers. The organisation of materials in the databases of web-based tools is not restricted by the necessity to store information in a bibliographic format, characteristic of on-line information retrieval systems. Instead, the flexibility provided by the world wide web permits the provider to store information in a database in a format that relates to the state's content standards. The capability of the internet to provide interaction between the information provider and users through electronic mail and discussion forums provides an added dimension for modifying and updating data not previously offered by on-line information retrieval systems. Furthermore, the interactive capacity of the internet has the potential to allow local users to acquire a subset of data, and add to that subset information on locally developed curriculum resources, teaching strategies, and so forth. Flexibility in search strategies is also offered on these web-based tools by combining the features of a controlled vocabulary afforded by simple keyword searching characteristic of information retrieval with

menu selection as a means of retrieval, typical of the hierarchical database designs of videotex. As the range and cost of different types of output in products from information systems are governed by their historical emergence as technologies within the information industry, the recent expansion of the internet as a means of exchanging information at an international level has led to the application of the full range of computer-based technologies for presenting output reports.

Outcomes

The development of a national web site may overcome many of the limitations identified by commissioned evaluators and independent commentators concerning the provision and implementation of curriculum materials for the Discovering Democracy program. The conclusion to this paper concentrates on discussing ways that a web-based tool, modelled on the features of web-based tools examined in the case studies, may remedy these shortcomings.

Whilst it could be argued that a centrally directed initiative may have been essential to establish a program for civics and citizenship education in Australian schools, it is debatable whether application of the research, development and diffusion model to provide a set of prescriptive, printed materials was appropriate. As well as falling short in providing an adequate supply of these materials for all students, restriction to the use of centrally adopted materials is likely to inhibit, if not stifle, the development of local initiatives in the long term.

This view is consistent with the findings of the evaluation of the Discovering Democracy program reported by Erebus Consulting Group (1999), which identified four levels of professional development supporting the program's implementation. Professional development was often initiated in schools by advocates. Then some form of locally based activity for sharing ideas and resources arose. State-level activities took the form of program launches, and providing funds to train trainers or support locally based networks for sharing ideas. Finally, many teachers established their own web sites, but these resources were not being fully utilised because of the lack of shared knowledge among teachers. There also appeared to be a positive relationship between the need for professional development support and the extent to which schools had implemented the program. Those schools that had not reached the stage of implementation required greater systemic support than had already been offered. On the other hand, schools at the 'leading edge' wanted expanded professional development support and a mechanism for updating the materials, preferably through a dynamic web-based publication.

The development of a national web site for the Discovering Democracy program, which would harness existing web-based resources and allow materials to be updated efficiently, is likely to provide the means to transcend the need for schools to use prescriptive, printed curriculum materials. A web-based tool designed to support the Discovering Democracy program could contain three essential, as well as several optional, features. First, a searchable database of Australian state and territory frameworks and syllabuses in the learning area of Studies of Society and Environment could be provided. Most importantly, the tool could provide a

searchable database of continuously updated teacher-developed lesson plans, assessment techniques and curriculum resources aligned to standards in state and territory frameworks and syllabuses. This database could be supported by a guide to a peer review process, modelled on that used by the New York State Academy for Teaching and Learning and the Southern Maine Partnership, for jurying lesson plans, assessment techniques and curriculum resources entered into the database. A fourth component of the web-based tool could incorporate elements of existing Discovering Democracy web sites viewed by stakeholders as sufficiently important to continue providing for teachers and students.

The advent of such a web-based tool may overcome several limitations of the research, development and diffusion model evidently applied to design and implement the Discovering Democracy program. First, the imbalance in subject matter content of the curriculum materials brought about by academic scholars favouring of discipline-based, academic criteria, which promote the formation of concepts rather than operations, may be corrected in teacher-developed resources. Second, the shift in the power structure of curriculum policy away from giving eminence to academic scholars in the role of authorship in developing curriculum materials to teachers as curriculum developers will increase the choice in options and strategies available to teachers, parents and learners. Third, the shift from centrally controlled curriculum change where teachers are seen as consumers of 'closed-in' textbook-like products to technologically based curriculum change will empower teachers with the information necessary to move to an 'open-out' curriculum.

Appendix A

Web Sites relating to the Discovering Democracy Program in Australia

As the following includes only web sites that devote considerable coverage to the Discovering Democracy program, this list should not be viewed as exhaustive.

National

The web site of the Curriculum Corporation includes a Discovering Democracy area at http://www.curriculum.edu.au/democracy.

Professional Associations

The web site of the Australian Federation of Societies for Studies of Society and Environment includes a Discovering Democracy area at http://www.pa.ash.org.au/afssse.

The web site of the Australian Principals Association Professional Development Council includes a Discovering Democracy area at http://www.apapdc.edu.au.

Higher Education

The web site of the Academics Consortium in Civics Education contains information on the Discovering Democracy program at http://civics.edfac.usyd.edu.au.

State Level

The web site of the Education Department of Western Australia includes a Discovering Democracy area at http://www.iinet/~aas/democracy.

The web site of Education Queensland includes a Discovering Democracy area at http://education.qld.gov.au/tal/ddemo.

The web site of the New South Wales Department of Education and Training includes a Discovering Democracy area at http://www. abc.net.au/civics/democracy.

The web site of the Victoria Department of Education includes a Discovering Democracy area at http://www.sofweb.vic.edu.au/sose/civics.

Appendix B

Web Sites and Web-Based Tools of State Education Agencies in the United States

Developing Educational Standards, a directory maintained on the web site of the Putnam Valley School District in New York state, provides access to seven types of listed web sites: standards by states; standards by subject areas; the United States government; other countries; centres, clearinghouses and laboratories; other organisations; and newspapers and magazines. All of the following web sites can be accessed through the Developing Educational Standards web site at http://putnamvalleyschools.org.

The web site of the Colorado Department of Education is http://www.cde.state.co.us. The web site of Standards in Action is http://www.cde.state.co.us/action.

The web site of the Georgia Department of Education is http://www.doe.k12.ga.us. The web site of the Georgia Learning Connections is http://www.glc.k12.ga.us.

The web site of the Louisiana Department of Education is http://www.doe.state.la.us. The web site of Making Connections is http://www.Icet.doe.state.la.us/conn.

The web site of the Maine Department of Education is http://janus.state.me.us/education. The web site of the Electronic Learning Marketplace is http://www.elm.maine.edu.

The web site of the Minnesota Department of Children, Families and Learning is http://cfl.state.mn.us. The web site of the Minnesota Electronic Curriculum Repository is http://mecr.state.mn.us.

The web site of the New York State Education Department is http:// www.nysed.gov. The web site of the New York State Academy for Teaching and Learning is http://www.nysatl.nysed.gov.

The web site of the Virginia Department of Education is http://www.pen.k12.va.us. The web site of A Commonwealth of Knowledge is http://www.knowledge.state.va.us.

The web site of the West Virginia Department of Education is http://wvde.state.wv.us. The web site of the Solution Site is http://www.thesolutionsite.com.

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