
STATE COUNCIL OF HIGHER EDUCATION FOR VIRGINIA

**Virginia Virtual University
(V²U)**

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A WORK IN PROGRESS

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INTRODUCTION

This document provides an overview of a draft proposal for a new systemwide initiative – the creation of a new type of quasi-public institution, the Virginia Virtual University (V²U). The intent is to provide a clearer understanding about what this virtual university proposal is – and is not – and to generate comments on the proposal.

As the Commonwealth's coordinating agency for higher education, SCHEV is obligated to provide leadership that enhances Virginia's position at the forefront of American higher education. In its work, SCHEV believes in collaborating with Virginia's colleges and universities and encouraging them to be entrepreneurial and innovative. The V²U proposal is firmly committed to these principles. V²U also has the potential to help more citizens achieve expanded access to all that Virginia higher education has to offer.

SCHEV is proposing this initiative to bridge existing gaps in Virginia's system of higher education. The V²U connects students and learning by creating an "umbrella" institution through which students could create individualized study degrees that select from the best and most appropriate providers of higher learning in the Commonwealth. The V²U would not offer any instruction on its own. Rather, it would serve as an educational broker.

It always has been and is SCHEV's intention to work with the institutions in the continuing development of this systemwide proposal. V²U will not compete with existing programs and institutions, but will complement them by helping the entire higher education system meet the needs of specific kinds of students.

The benefits of creating the V²U are many.

- **V²U increases access to Virginia higher education** – For students that are place bound, home bound, or work bound, V²U offers an option for a degree that is not readily available. Hence, V²U provides access to higher education that otherwise would not be available.
- **V²U meets unique student learning needs** – Today's students demand and require a wide variety of educational opportunities, from traditional residential experiences to online courses and e-mentoring. The V²U allows students access to higher education that is more diverse, customized and unique to their needs. It helps students combine many settings into a cohesive whole.
- **V²U promotes affordability in Virginia higher education by overcoming obstacles to financial aid** – For students who enroll part-time at multiple institutions, federal financial aid is not possible. However, by creating a new "umbrella" institution, students who are full-time at V²U -- but part-time at two, three, or four institutions or involved in formal learning activities with other providers -- can qualify for and receive federal and state financial aid.

- **V²U enables Virginia to better prepare for and meet workforce issues**
 - By creating a degree-granting institution that allows students to focus on studying and learning (from a variety of different institutions) what they need for their careers (when and where it works best for them), V²U helps promote a more flexible and competitive workforce. The competitive nature of the increasingly global economic system requires workers who are knowledgeable, skilled, and able to adapt in order to keep pace with change. V²U can help Virginia enhance its competitive edge.
- **V²U provides additional educational options & alternatives for students**
 - The Commonwealth and its citizens already benefit from several very successful distance-learning programs, in particular the Electronic Campus of Virginia (E-CVA), ODU's TeleTechnet and the Southern Regional Educational Board's Electronic Campus (SREC). These programs have done excellent work in many areas, including providing an online catalog of courses by different media as well as promoting best practices in online learning. Yet, E-CVA's and SREC's "degree offerings" remain tied to individual institutions. The V²U is different because it would be a degree-granting institution.
- **V²U contributes to Virginia's leadership in e-learning** – By creating a new institution completely independent of existing colleges and universities, V²U not only encourages greater commitment and growth in e-learning offerings by traditional institutions, it also enables Virginia's colleges and universities to enhance their competitiveness in the increasingly popular e-learning arena.
- **V²U efficiently leverage resources across public institutions** – The complexities of virtual university offerings are so great, it is almost impossible for a single public institution to develop sufficient online infrastructure to develop programs. The V²U effectively builds a bridge across all Virginia public institutions that lets them focus on what they do well instead of trying to be all things to all people. The sole mission of the V²U is educational brokering.
- **V²U helps build knowledge capital** – Through a focus on personalization and knowledge chunks, the V²U provides a way for Virginians to capture and utilize critical knowledge assets. E-learning is a top strategy in knowledge management and the V²U promotes retaining and enhancing knowledge capital in Virginia's most valuable asset – our people.

Along with V²U's many benefits, there are a number of other compelling reasons why SCHEV is championing this systemwide higher education initiative. At the heart of SCHEV's mission is encouraging creative thinking to make Virginia's outstanding system of higher education even better. We understand the importance of a sound, vigorous, and progressive system of higher education. The V²U is being advanced by SCHEV to help make Virginia's higher education system a continued success.

SCHEV long has been motivated by the powerful desire to maximize the potential for access to higher education for all citizens of the Commonwealth. The V²U, in many ways, is about providing new types of access to Virginians.

This approach to access is consistent with the vision of U.S. Department of Education Secretary Rod Paige.

This administration wants to make sure that no one is left behind when it comes to access to higher education and training. Distance education enables countless Americans to reach their academic goals without the restrictions of time and place that make it difficult for people like working parents, rural students, and students with disabilities to get a college education.

Since the V²U will allow full-time students to obtain state and federal financial aid for courses taken across different institutions as part of their learning plans, it takes a significant step towards encouraging all Virginians to take part in higher education. While some are concerned that the V²U will create more “have-nots” with its pay-for-services model, we expect that quite the opposite effect will emerge. The V²U will provide many more opportunities for access.

PLANNING PROCESS

This summer, SCHEV’s new Chairman, Dr. Carl Kelly, a senior executive with Oracle Corporation, asked staff to develop a concept proposal for the Council to discuss about the development of a virtual university. This idea has been evolving for several years as past and present members seek to advance e-learning.

In 1998, SCHEV sponsored a forum, *Distance Education in 21st Century Virginia: Charting the State’s Policy*. The forum was focused on identifying ways in which the Commonwealth could foster collaboration – instead of competition – among the public and private colleges and universities in the development of distance learning services.

In 2000, SCHEV sought funds to create a position to help it better ensure coordination and efficient use of resources in the delivery of higher education programs via distance learning technologies. Although the position was not funded, SCHEV has continued to think, work, and plan in this important public policy area.

SCHEV certainly recognizes that many other groups statewide, including the Distance Learning Steering Committee, E-CVA, TeleTechnet, SREC participants, and others, also have been engaged in wide-ranging and thoughtful dialogue about distance learning and the Virtual Dominion. SCHEV values the important work undertaken and results already accomplished by so many in promoting distance education in Virginia.

The Virginia Virtual University is a work in progress. It will continue to evolve as SCHEV seeks input and receives feedback from those with an active interest in realizing the benefits of applying technology to teaching and lesson delivery for students and citizens of the Commonwealth. Separate business, marketing, and technology plans also will be developed if the V²U initiative moves forward.

The Council members will act upon the V²U proposal at the SCHEV meeting on October 16, when it considers this and other systemwide higher education policy recommendations to the Governor and the General Assembly for the 2002 Session.

WHY TAKE A NEW APPROACH?

It has never been more evident that the Internet has dramatically changed the nature and work of business and industry, higher education, and many other types of organizations. In order to embrace this rapidly emerging paradigm of the web, we must question some of our most fundamental assumptions. Entire industries are reinventing and reengineering their processes with new kinds of peer-to-peer and business-to-business partnerships, forced to ask again and again what their real mission is and what business they should be in. The linear chain of supply and demand has been broken apart with disintermediation, and new types of suppliers and delivery systems such as Amazon.com and E-Bay.

Higher or post-secondary education is not immune to these changes. Clearly, these changes are impacting higher education, though there is still a strong call by students for many types of traditional and residential institutions. Yet, where the for-profit and corporate sector of higher education was once viewed with alarm by the academic community, new types of institutions such as the University of Phoenix, Jones International University, and UNext are now seen as a natural progression.

It is important to address the Commonwealth's long-range needs from its higher education system, particularly in the areas of under-served and non-traditional students and workforce development. Like many, SCHEV recognizes that higher education contributes significantly to the Commonwealth's educational, economic, social, and civic vitality – now and in the future. The ongoing development of a comprehensive Systemwide Master Plan – essentially a schematic overview or framework – is one way that SCHEV is working to help policymakers understand, plan for, and ensure higher education's appropriate position in the future success of the Commonwealth. The Virginia Virtual University is another forward-looking initiative. It would be a new kind of institution premised upon thinking creatively and in new ways about the delivery of education.

Fortunately, Virginia already benefits from several very successful distance learning programs. Old Dominion University's TeleTechnet initiative, for example, has done an impressive job of meeting the needs of citizens across the Commonwealth through its articulation agreements with community colleges for the "2+2 program" and its site-based satellite delivery. ODU also has added its own Weekend College model and a variety of online courses. In addition, the Electronic Campus of Virginia has done excellent work in a variety of key areas, including providing an online catalog of courses by different media and in promoting best practices in online learning. Some Virginia colleges and universities also have been involved in helping to develop the Southern Regional Education Board's initiative for "Ways-In," with its learning portal approach and potential integration of online registration to Instructional Management Systems (IMS)-compliant student information systems.

All of these undertakings are necessary for Virginia's continuing success in the 21st century. Yet, there is still a pressing need for an alternative e-learning model that breaks apart even further some of the traditional assumptions of higher education – including the nature of student coursework, faculty roles, and tuition structures while preserving values about academic quality and integrity and governance.

As business and industry and the military embrace the concepts of knowledge management (KM), they put tremendous value on recognizing the hidden or “tacit” knowledge assets of the workforce. Unlike “explicit” knowledge, which is the stuff of books, “tacit” knowledge resides in the heads of people and is gained primarily through experience. E-learning is the number one and most visible response within KM strategies to capture, retain, and effectively leverage knowledge. The KM revolution of e-learning will occur whether or not the rest of higher education chooses to become involved. Through its V²U proposal, SCHEV proposes that the Commonwealth not be left behind, but keep moving forward in further realizing the potential of e-learning.

To seize this opportunity and meet this new demand, we believe that a new type of higher education institution is needed that will tap into the e-learning market for knowledge management – one that is not wedded to traditional course structures, faculty roles, and outmoded expectations of undergraduate education. This vision must be secure in a new type of mission – brokering learning that occurs in a wide range of contexts, from 15-week courses and independent studies to mentoring and on-the-job experiential education. This vision also must incorporate cutting-edge concepts like effective leveraging of technology, outsourcing, and above all, focusing on individuals and their unique wants and needs from higher education. We believe that the V²U would be a major step forward in realizing this vision for Virginia higher education.

Workforce development is not the only beneficiary of this approach. Many types of students do not fit into the traditional age, residential model of higher education. These students are in many cases well served by Virginia’s outstanding system of community colleges and by regional centers, such as those in Southwest Virginia, Roanoke, and Virginia Beach, among others. However, many of the undergraduate programs in the Commonwealth require 30 to 60 hours of residency, even though students already may have successfully completed 120 or more credit hours.

This new type of higher education institution breaks apart the assumption of residency. While it does not go as far as the Western Governors University to rely only on competencies, this proposal suggests that with careful reflection and sound academic counseling many students can pull their lifetime of learning into a cohesive whole that is worthy of credentialing with a degree. While the degree would still be credit-based, the V²U is one of the first programs in the country to do away with residency for its own sake, and instead uses the accumulation of credits only as a starting point in a pragmatic discussion of individualized life-long learning.

With this new model, the focus of the web and knowledge management on personalization, customization, and individualization is put onto the processes of student learning. The V²U would offer a totally personalized curriculum built on an individualized learning plan that meets the needs of the learner, anytime/anywhere, incorporating “knowledge chunks.” This new approach would be accomplished through the use of faculty generalists who help students develop learning plans and use a rigorous assessment-driven model to evaluate learning to earn a credential. Through careful documentation and review of an electronic portfolio, transcripts, test scores, capstone experiences, and learning plan evaluations, faculty will help students pull together a unique and transformative education.

Part of the demand for the V²U comes from enrollment projections that suggest an increase of 38,000 additional students over the next decade.

Part of the demand for the V²U also comes from the ability to create additional workforce development programs that are tailored to the interests of specific industries and their employees through a focus on knowledge chunks.

In addition, part of the demand for the V²U comes from the recognition that the state's number of capital outlay projects cannot continue to grow indefinitely. While there is a level of overcrowding already demonstrated in space utilization, once peak enrollment projections for the next decade have been achieved, Virginia does not want to be left with excess seat capacity. Online brokering – which requires no course seats of its own by the V²U but leverages courses at existing institutions – has great potential to help SCHEV and the Commonwealth address the issues of space planning. There will be no single answer and hybrid solutions like the V²U are necessary for balancing the competing demands and expectations upon Virginia's higher education, which will be discussed in SCHEV's upcoming Master Plan for Virginia Higher Education.

OVERVIEW OF V²U MODEL

We recognize that, if viewed through the lens of traditional higher education, the assumptions of the V²U may appear to some to be naïve and uninformed. This reaction is to be expected when one entertains a new or emerging paradigm. It is somewhat akin to a board-certified physician looking at the efficacy of research on alternative treatments such as acupuncture. The V²U model involves thinking “outside of the box.”

The mission of the Virginia Virtual University – or V²U – is to broker learning, not to create another competing public university. The V²U would not offer courses of its own. Instead, it would advise students online as they draw courses from a variety of traditional and virtual sources into a cohesive learning plan. Graduates of V²U would complete a certificate or earn an associate's, bachelor's, or master's degree.

The V²U faculty would serve as higher education generalists and registrars, providing one-stop, anytime/anywhere advising, and course shopping for online students. Like all other institutions in Virginia, V²U would have to be approved by SCHEV to award degrees and would seek national accreditation from the Distance Education and Training Council (DETC) and regional accreditation from the Southern Association for Colleges and Schools (SACS).

There will be no competition for students between the V²U and existing Virginia institutions. Rather, as statewide enrollment in higher education is expected to increase by over 38,000 students between now and 2010, enrollment at Virginia public and private colleges and universities could significantly increase as the V²U worked to promote these courses in the learning plans of students. Course enrollment would continue to be counted at the institution offering the course, so the V²U would not impact existing resource allocation models. Also, if a first-time, full-time freshman from a Virginia institution chooses to seek credentialing from the V²U, SCHEV has agreed that the transfer institution would have the option to include them in its graduation rate cohort.

The V²U would be structured as a public institution, with the major exception of funding. After initial seed money, we expect the V²U would rely solely on income generated from the services it offered (advising, transcript evaluation, etc.), and private sponsorships. This entire endeavor would only grow as enrollments permit while maintaining target student-faculty ratios.

As stated above, the V²U would apply for candidacy for accreditation to SACS and DETC. No “Substantive Change” reporting to SACS is required by existing Virginia institutions. The role of the colleges and universities is to continue to offer their own courses, and develop new ones in already approved media. While other accrediting bodies such as North Central have taken visible action in support of alternative e-learning efforts such as Jones International University, SACS has adopted the Western Interstate Commission on Higher Education (WICHE) criteria on distance learning. SCHEV believes that the WICHE and SACS accreditation criteria can be met by this proposed model for a new type of institution in Virginia.

As Judith Eaton argues in her recent Council of Higher Education Accreditation monograph Distance Learning: Academic and Political Challenges for Higher Education Accreditation (2001), “distance education challenges some fundamentals of the academic work and the politics of American higher education – thereby challenging some related features of quality assurance and self-regulation...”

The V²U would meet this challenge with plans that maintain the values of quality learning, academic integrity, assessment, and shared governance. The V²U is being designed to appropriately address the core academic values, quality, and regional accreditation concerns which are outlined by Eaton (2000) as the “Challenge of Distance Learning.” These relate to institutional autonomy, collegiality and shared governance, the intellectual and academic authority of faculty, the degree, general education, and site-based education and a community of learning, and the degree awarded.

While accreditation issues are being resolved, one initial focus of the V²U may be to offer certificate programs that combine non-credit, knowledge “chunks” to meet the needs of workforce development. This important area, in itself, is a massive market for the e-learning arena and one which will certainly be tapped as the V²U responds proactively to the needs of business and industry for this knowledge management strategy.

The preceding introduction to this model suggests that it is part of an emerging new paradigm of higher education. This innovative proposal pays attention to the integration of the Internet in all aspects of organizational and daily life and recognizes that e-learning is valued as a top strategy in knowledge management. In order to participate in this new paradigm, planners in Virginia need to question their most basic assumptions about faculty roles, space, course structures, residency, and ask “What business we are in?”

The Council for Higher Education Accreditation suggests that this task is a responsibility which accrediting agencies must address – to “identify the distinctive features of distance learning delivery” (Eaton, 2001, p. 13). Eaton further explains:

Taking a fresh look at the learning environment is important because we need to be able to peer around the edifice of assumptions we have built about academic quality in a site-based setting. We need to approach distance learning as a new and unfamiliar form of education, asking ourselves what resources, capacities and processes are involved in distance delivery, and what student learning outcomes ought to be expected from it (Eaton, 2001, p. 14).

V²U COMPARED TO OTHER DISTANCE LEARNING MODELS

We believe that the V²U initiative is unique, a departure from other state-led virtual university initiatives and one which has great promise as a new, hybrid model. The following table provides a comparison of some of the critical V²U features to those of E-CVA, TeleTechnet, SREC, California, and Kentucky. In some ways, there are obvious similarities to other states' efforts. In others, such as the focus on online brokering, the model is very different.

How V²U Compares

Feature	<i>Virginia Virtual University</i>	<i>Electronic Campus of Virginia</i>	<i>TELE-TECHNET</i>	<i>Southern Regional Electronic Campus</i>	<i>California Virtual University</i>	<i>Kentucky Virtual University</i>
Focus on brokering learning	Yes	No	No	No	No	No
Offers own online courses	No	No	Some. Mostly satellite and traditional	No	No	No
Online advising	Yes	No	In-person, on site	No	No	Call center
Use call center (CRM) model	Yes	No	No	No	No	Yes
Degree-granting	Cert., AA, BA, & MA	Links to campus programs	From ODU. BA and MA. VCCS for first 2 years	Links to campus programs	Links to campus programs	Links to campus programs
Single admissions form	Yes	No	ODU	No	No	Yes
Use learning plans	Yes	No	No	No	No	No
Use narrative evaluations in addition to grades	Yes	No	No	No	No	No
Promote learning teams	Yes	No	No	No	No	No
Promote mentoring & peer-to-peer learning	Yes	No	No	No	No	No

Feature	<i>Virginia Virtual University</i>	<i>Electronic Campus of Virginia</i>	<i>TELE-TECHNET</i>	<i>Southern Regional Electronic Campus</i>	<i>California Virtual University</i>	<i>Kentucky Virtual University</i>
Online catalog for learning opportunities	Use others	Yes. Primary tool	Limited	Yes. Primary tool	Yes. Primary tool	Yes. Primary tool
Student services	Yes. Outsourced	No	Traditional	No	Limited	Limited. Tutoring
Online library	Outsourced to schools. Links to VIVA	No	Through ODU	No	No	Some shared resources
Individualized studies major	Yes	No	Only B.S. in K-6 Educ. & Communication	No	No	No
Adult degree program model	Yes	No	Weekend college for 6 UG majors	No	No	No
Portfolio assessment	Yes	No	Yes. Not online	No	No	No
Online degree audit	Yes	No	Through ODU. Not online	No	No	No
Students must meet general competencies	Yes	No	Meet major requirements	No	No	Yes
Credit for life experience	Yes	No	Yes	No	No	No
Financial aid for full-time virtual load	Yes	No	Through ODU	No	No	No
New faculty generalist role	Yes	No	No	No	No	No
Individual academic calendars	Yes	Traditional	Traditional	Traditional	Traditional	Traditional
Focus on knowledge chunks	Yes	No	No	No	No	No
Disaggregated tuition structure	Yes	No	No	No	No	No
Based on VA Distance Learning Cost Model	Yes	No	No	Distance Learning Policy Lab	No	No

Another model which is currently being discussed for addressing the needs of online learning statewide is being developed by the Southern Regional Education Board and its Southern Regional Electronic Campus called “Ways-In.” There is no duplication of effort between the V²U and “Ways-In.” This situation is due, in part, to the fact that the V²U is not primarily a software-based solution. Rather, it represents thinking about an entirely different type of institutional role. SREC “Ways-In” is an admirable and much-needed effort that uses IMS-compliant XML to share online registration, course, and admissions data between different student information systems via a central portal approach. It will take multi-state participation to accomplish this objective. In Virginia,

not all institutions likely will have the resources to participate and create the interface to their student information systems. While some will be able to participate fully, and while this type of online portal is very much needed to share online course offerings throughout the Commonwealth, it is a different proposal than the V²U.

The V²U will use a variety of web applications for its online interface between students and faculty generalists. However, the registration for courses will take place between the student and each institution offering the course, as the V²U serves only as the broker. The V²U would welcome and incorporate the “Ways-In” portal to help it better serve students and their learning needs, but in no way would it replace or duplicate the role envisioned for the V²U.

The V²U will not compete with existing programs by major in Virginia. Instead, V²U will focus on helping students design an individualized studies curriculum. The approach outlined in the V²U is comparable – but not identical – to the adult degree program model in place at Mary Baldwin College, Eastern Mennonite University, and the University of Virginia. It also is similar to the Bachelor of Arts in Individualized Studies (B.A.I.S.) degree at George Mason University. All of these existing programs still are rooted in the concept of interdisciplinary majors.

FOCUS ON “LEARNING CHUNKS”

With the popular emergence of Winter terms, the flexibility of summer program offerings, and different stop and start dates for increasing numbers of college classes, the traditional 15-week course is quickly becoming outdated for many and will not be used as the model for accumulating learning at the V²U. Instead, the focus will be on helping students write learning plans that consider a wide variety of experiences and knowledge. These “learning chunks” or “knowledge chunks” will be combined into course equivalencies for the purpose of receiving credit only. It is recognized that learning does not start and stop in artificial course structures, but is an ongoing, individual, and lifelong process.

A “chunk” is any unit of knowledge that is familiar or is in the “memory’s index” as Simon (2001) describes, and can be recognized within a field of expertise. Knowledge “chunks” are called upon in order for us to recognize patterns in complex work. Each chunk contains “many interconnected facts, a network or framework of facts,” explains Brightman (2001). Chunks of knowledge and the “structured relationship between individual units of information” are essential to valuing the real assets of an organization – Knowledge Capital (Cole, 2000). [See “Attachment A” for more details.]

V²U faculty will work with students to help them evaluate and structure a series of learning experiences or knowledge chunks that will become an integrated learning plan. A learning plan will be used at the outset and an evaluation will be completed by the student and faculty advisor once the learning is complete. Traditional grades, if awarded by the institution which offers the course, would be used to evaluate adequate completion of the learning process. However, these serve as only part of the assessment process. It is expected that students will work with V²U faculty to design

their own individualized and personalized academic calendars. In reviewing learning plans, students will either successfully meet their learning contracts, revise them accordingly, or fail to meet their part of the contract.

The onus is on the student, working with a V²U faculty member, to help translate a series of knowledge chunks into a cohesive and integrated learning whole that makes sense academically to her/his unique needs. Similarly, the V²U faculty may work directly with businesses to design degree programs individualized to the specific industry and setting and workforce development issues. If this collaboration successfully takes place, the business or industry will provide up-front development costs to cover the creation of these unique, individualized learning opportunities.

The V²U faculty would, if a student chooses, provide a review of existing coursework and experiential knowledge as part of the evaluation of credit for critical life experience, and as part of the degree audit process for credentialing. While there is sometimes controversy over what constitutes credit, the policy of the V²U would be to award credit when there is successful completion of learning comparable to that offered by an in-state course. Faculty members will help students identify potential courses that match their learning outcomes; but it is the responsibility of the student to document her/his unique combination of study and experience in these knowledge chunks. The lessons of institutions such as Old Dominion University in this area, along with the work done by the Council for the Advancement of Experiential Learning, will be important to the development of this feature of the V²U.

As the V²U proposal has been presented and discussed with interested groups, some questions and concerns in this area have been raised, as would be expected with any new initiative. For example, some administrators have expressed worry over V²U's impact on the course load of existing institutions. As has been stated at these feedback sessions, let us be clear once again here: institutions are – and will remain – the “gatekeepers” of their own courses. V²U students will apply through traditional admissions and registrar processes to take courses elsewhere. Virginia institutions will not be forced to admit them against their will. However, we believe that there are plenty of opportunities where courses at institutions across Virginia are open to part-time and transfer students, as long as they meet the prerequisites.

At some institutions, the development of online courses is geared not to meeting the needs of new populations, but to better serving existing residential students. There is nothing inherently wrong with this course of action and it may make complete sense for some institutions. However, there are other institutions that will gladly take the opportunity for increased enrollment because it provides additional opportunities for state financial resources. Similarly, it is hoped that by identifying course needs, institutions will be encouraged to offer additional sections of courses if there is sufficient enrollment.

Other administrators have questioned the transferability of work done at the V²U. It has been asked “How can knowledge chunks be measured in semester credit hours?” It is expected that V²U faculty will work with students to translate their knowledge chunks into equivalent course credit hours, using “time on task” as a basic metric. The V²U is not a competency-based degree like the Western Governors University.

It still requires completion of the appropriate number of credit hours to earn a degree. However, the notion of the course has been disaggregated so that students may combine a unique set and series of knowledge chunks into credit hours. These credit hours will be listed on their transcripts, along with a synopsis of their learning plans and narrative evaluations of how these were carried out. This model is in place at other institutions such as Vermont College and Goddard College for their adult degree program learning plans. Assessment at these non-traditional adult degree programs shows a high level of success for these graduates, including placement in high quality graduate programs and scores on standardized tests.

Another concern raised about the V²U model is that it allows students to take courses outside of any curricular context. Yet, such concern fails to recognize the course integration within a larger curriculum. The use of individual learning plans, evaluations, and careful review by faculty is designed to help bring cohesiveness to the sequence of knowledge chunks and courses taken by students. It is not expected that students will take one course from many institutions. Rather, coursework will be done with several schools that meet the students' needs over time. A great degree of curricular integration, therefore, already will be in place. Also, the work of the faculty generalist at V²U is to help make sense of individual learning plans, including the assessment of the six basic competencies and the breadth and depth of general education coursework. Wherever there are deficits, faculty will work with students to include courses to address these as part of their evolving learning plans.

ASSESSMENT OF CORE COMPETENCIES

In order to ensure that there is academic integrity to the credentialing process, the V²U would incorporate a series of core competencies as part of its integral assessment program. In developing their learning plans and in applying for review of knowledge chunks to count toward completion of a degree, V²U students would have to demonstrate that they have acquired fundamental understanding and skills. Like other Virginia public colleges and universities, the V²U would have to develop a plan to assess, report, and validate college student competency levels in each of six areas being developed by SCHEV in cooperation with the institutions. Being phased in over the next three years, the core competencies are writing, technology, oral communication, mathematical analysis, scientific literacy, and critical thinking.

We also envision that the V²U will incorporate assessment into all learning experiences. Assessment will be built into the writing of learning plans and into the narrative evaluation of their success. Assessment models will be built into the capstone course structures and learning chunks necessary to complete degree work. Similarly, the V²U will promote peer-to-peer and mentoring relationships that allow students to reflect with others on their learning experiences. A number of features will be built into the online presence of the V²U to help facilitate the feeling of online community through assigned learning teams. Students will be part of a learning team that will help them reflect on their experience and make the most of their online plans. For example, some learning plans will require that students partner with students working in similar topical areas or living in geographic proximity to share resources and thereby exponentially increase the value of their learning through online interaction. As part of the

assessment process, all students will be required to maintain online learning portfolios which provide documentation of their V²U education, including their participation in learning teams and mentoring relationships.

There will be many ways to develop learning portfolios that adequately demonstrate students have acquired sufficient knowledge and skills in the identified competencies. One way is for students to adopt a curriculum model -- such as used at traditional institutions -- that includes the standard general education course sequence. It is implied that V²U students will need to develop a well-rounded general education in order to satisfy competency requirements. However, it is recognized that there are many ways to achieve this goal. One size does not fit all, so V²U students will be given the ability to individualize and personalize this important process to meet their special needs and interests.

OUTSOURCING STUDENT SERVICES AND LIBRARIES

We believe it is worthwhile that the V²U asks “What business are we in?” and “What makes us unique?” This vision is not about whether V²U needs to replicate the traditional higher education model and be all things to all students.

For some student services, including financial aid support and career counseling, it may be possible to outsource these to another institution or to business and industry. This type of outsourcing is more common with bookstores, parking, and housing; but there is no reason why the V²U also should not explore this approach in other areas of support.

The evolving Virtual Library of Virginia (VIVA) is a model for the V²U to incorporate. Why should a virtual institution replicate the traditional bricks and mortar library to meet its students’ needs? It is relatively easy to partner with existing institutions, which for a fee per-student will allow V²U students access to their collections and services. The same is true for online collections, where some institutions in Virginia have made major strides and become national leaders in building the electronic academic village or offering state-of-the-art E-Books to its students. We see no reason to reinvent the wheel. The V²U will partner with these institutions to offer its students the same level of online services, in effect facilitating their further development by providing more financial resources.

In addition, as part of outsourcing strategies, the V²U may want to arrange special credit relationships for students with Virginia companies. It may be possible to direct interest revenue from V²U-sponsored credit cards back to the institution to help defray student costs and to promote start-up activities. We believe the question needs to be asked again and again: “What business should the V²U be in?” “What makes it unique or different?”

The focus of V²U is on brokering learning. Its focus is not upon building infrastructure that is more efficiently or effectively provided by other institutions or by business and industry.

BREAKING APART ASSUMPTIONS ABOUT FACULTY ROLES

As the model for the V²U continues to be refined, one thing is clear – it challenges some of the more traditional assumptions about the nature of higher education, especially those faculty roles. This new type of institution can take these risks, where it is very difficult for traditional colleges and universities to challenge the academic culture and climate.

The V²U will not employ faculty in the traditional sense. Rather, we envision it being staffed by faculty generalists who have unique knowledge and experience in online learning, assessment, and higher education. This focus “unbundles’ the many roles of the faculty member,” as described by the American Federation of Teachers (AFT) (2001) in its monograph “A Virtual Revolution: Trends in the Expansion of Distance Education.”

Recognizing that interaction with faculty is critical to theories of student engagement and involvement, the V²U is purposefully designed to build in feedback between students and faculty. This essential dialogue occurs through shared design, review, and evaluation of learning plans; but also through formal and informal networking, advising, mentoring, and counseling.

The AFT monograph lists 14 guidelines for “Good Practice” in Distance Education and the V²U design adheres to them. These guidelines include:

1. Faculty must retain academic control
2. Faculty must be prepared to meet the special requirements of teaching at a distance
3. Course design should be shaped to the potentials of the medium
4. Students must fully understand course requirements and be prepared to succeed
5. Close personal interaction must be maintained
6. Class size should be set through normal faculty channels
7. Courses should cover all material
8. Experimentation with a broad variety of subjects should be encouraged
9. Equivalent research opportunities must be provided
10. Student assessment should be comparable
11. Equivalent advisement opportunities must be offered
12. Faculty should retain creative control over use and re-use of materials
13. Full undergraduate degree programs should include same-time same-place coursework
14. Evaluations of distance coursework should be undertaken at all levels (AFT, 2001, p. 19).

We expect that V²U faculty will have earned doctorates and be able to serve multiple roles, such as assisting students through advising and helping them to navigate the maze of financial aid and degree audit requirements. They will not be financial aid specialists. This function, and the associated print and online form processing, will be outsourced. But the faculty will need to be generally aware of the options and impact of financial aid as they facilitate the development of learning plans.

These faculty may be part-time at first, as at the University of Phoenix; but they will not be tenure track and will not be driven by a reward structure based upon teaching, research, and service. They also will be content generalists, able to pierce through complex course offerings to help students get the most out of their learning experiences. Their performance review will be based on student evaluations of their work and on the success of student progress.

Should the V²U down the road decide to develop degree programs by major that are not offered by another Virginia institution, then it would have to employ faculty who have completed advanced degrees in these disciplines. Some of the V²U faculty also may work with existing institutions to promote new models for online courses, facilitating unique models for content creation and for effectively leveraging Internet technology. Again, the V²U will not offer its own courses, but promote their development through creative partnerships.

The skill set, knowledge, and experience necessary to succeed as a faculty member in the V²U are not common and there is some concern expressed about whether it will be able to attract faculty. We believe that we will be able to hire faculty with advanced degrees and SCHEV already has received numerous queries about potential positions sparked by media coverage. We believe faculty will be interested because the V²U is representative of a new paradigm in higher education, one which disaggregates faculty roles away from the traditional triumvirate of teaching, research, and service. The emergence of teaching-based tenure is only one indication of the ways institutions are experimenting with alternatives to the faculty reward structure.

A certain economy of scale will be at work, as faculty members develop increasing expertise in evaluating these portfolios. Examples of best practices in creating portfolios will be available, along with other online resources such as digital video of faculty members discussing issues which arise in putting together a portfolio. It is expected that students will prefer the pay-as-you-go approach and that online resources to jumpstart and streamline the portfolio process will help keep down the costs of faculty involvement.

BREAKING APART ASSUMPTIONS ABOUT TUITION AND FEES

Similarly, assumptions about the academic calendar and the structure of tuition charges also will be challenged. Students will be asked to pay only for those services that they personally want and need to develop their unique learning plans and seek credentialing.

This new approach to comprehensive online learning will work because the V²U will have no need for infrastructure comparable to that maintained at traditional institutions. The entire approach to student services, advising, and credentialing will be disaggregated. Students will pay only for what they want in terms of online services. They might, for example, pay an hourly rate for a V²U faculty member to review their transcripts and approve a learning plan. Or they might pay for V²U faculty to help them develop a capstone learning experience that will document their meeting assessment competencies. Key to the V²U model is that students “pay only for what they want” with no hidden subsidy of infrastructure.

There are few models that incorporate this bold aspect of the V²U model. Why do we think it will work?

The 1990's was a decade of consumer protection through legal decisions over the use of student fees, the emergence of Student-Right-To-Know Act and other reporting legislation, and the work of the Report of The National Commission on the Cost of Higher Education College Cost Commission entitled Straight Talk About College Costs and Prices. Great concern was placed on understanding the concepts of price and cost and investigating the idea of hidden subsidies. There also was a growing attention to e-commerce principals for personalization, such as individual portal development, and business-to-business relationships, which allow for mass customization of products.

Out of these lessons come our understanding and belief that students do not have a problem with paying for services, so long as they clearly get what they pay for, and so long as the services directly meet their individual needs. While there is still very much a place for state-supported higher education that subsidizes the cost of learning, the relationship between tuition and fees and cost is not otherwise clear. With the V²U model, students get only what they pay for. Every attempt is made to keep costs as low as possible. That is one reason why the V²U is being developed as a quasi-public institution – not to generate as much revenue as possible, but to serve as many students as possible at a reasonably low cost.

As the National Cost Commission report points out, there is a strong perception that undergraduate students pay hidden subsidies to maintain infrastructure such as research that they do not need. There is extensive attention given in the current higher education literature to the notion of subsidy and to state roles, particularly as revenue from state appropriations is declining as a percentage of total revenue.

With this bold approach to disaggregating tuition, the V²U model is built on meeting expectations of consumer confidence, specifically that students get what they pay for and do not pay for hidden and unnecessary subsidies for infrastructure that do not serve their needs.

WHAT MIGHT THE FIRST V²U STUDENT LOOK LIKE?

Initially, we envision that marketing will focus on two types of potential students – the non-traditional adult learner and those pursuing workforce development. Here is a scenario of what it might look like when a student comes to the V²U

Mary Smith is a 28-year old mother of two whose children are now in school full-time and who has decided to re-enter the workforce. She has an entry-level technology support position, has earned 90 credits so far as an art major, but dropped out of college when her first child was born. She loves web design and sees a lot of potential jobs, but doesn't have the bachelor's degree that many employers require for her to get the salary level she needs. She also realized that she needs to know a lot more about technology and tools, but doesn't want to go as far as, say, Microsoft certification.

After finding the V²U website, Mary reads about the degree program options which are available and about the types of services which are provided. Mary completes an online application to the V²U in which she describes herself and writes an essay that reflects on her past learning, experience, and where she sees herself headed in the future. She uses her credit card to pay for two hours of faculty time; one hour to review her transcript and admissions essay and a second to talk with her on the phone about her plans.

Over the next month, Mary works to put together a learning plan that will meet her needs. She knows that she needs the equivalent of 120 hours of credit work to earn a B.A. degree and that she will have to put together an electronic version of a portfolio that will document her work. She begins assembling materials for the portfolio, including scanned versions of artwork and links to a website she has developed.

Mary next decides to pay a faculty member to evaluate her learning plan. With some modifications, a plan is developed and agreed to as a learning contract. Mary will take an online course in web graphics design from a university, a classroom course in design methods from a community college, an independent study, and another online course in line with a traditional general education curriculum. Some of these choices are designed to meet her immediate needs, while others will help her to build her portfolio and get the skills and knowledge necessary to meet competencies for graduation.

Mary's semester starts when she chooses and after completing her work, she goes online and requests that her V²U faculty evaluate her progress. Both Mary and the faculty review what she did and prepare a narrative evaluation. Mary completes a satisfaction survey and feedback about the faculty member. Together they prepare the next learning plan.

Over time, Mary completes her degree work with a combination of online courses, classroom courses, independent studies, advanced placement tests, and credit for critical life experience. Her faculty advisor has worked closely with her throughout in designing and evaluating learning plans. It is clear how her electronic portfolio documents that she meets the competencies for earning a degree.

She also has worked with fellow students as part of a learning team. One member of the team lives near her and they get together in person occasionally. Her new best online friend, though, lives across the country and they have never met except in e-mails, chat rooms, and a simulation exercise. They share many aspects of their lives.

When she needs a library, Mary uses the online catalog that is available to her as part of being a V²U student, paying an additional fee for this service when she is not eligible for library access because of taking a course at another Virginia institution. She spends time with the V²U website resources for career counseling, has purchased several hours of telephone time and evaluation of her learning plan from a career counselor, and has completed a battery of career planning tests. She completes her degree with a capstone experience, an internship in a web-design shop followed by a senior project.

All of this information and her performance are reviewed, along with her transcripts and portfolio, and approved by a vote of the faculty as a whole after she applies for degree candidacy. After paying for this service, she is notified that she has met the requirements for graduation and has earned a degree. She may even participate in a specially arranged online graduation ceremony, where representations of her faculty and her are shown as avatars in an online hall. With a click of the mouse, she is handed her diploma.

From her career counseling and experience with the internship, she targets the job she wants and writes a letter of application, even though no job is currently posted. She is armed with her portfolio and documentation of her skills. Mary gets the job she wants. Later, she is asked to complete a graduate satisfaction survey and whether she would like to serve as a mentor to other V²U students in web design. After a period of time, her employer is asked to complete an employer satisfaction survey. The results are used as part of the V²U culture of continuous quality improvement.

V²U RELATIONSHIP TO ELECTRONIC CAMPUS OF VIRGINIA

The E-CVA has been very successful in bringing Virginia institutions together with a shared online course directory and in promoting discussion of various models for technology in learning. A request for proposals for a consultant to help further advance the E-CVA was developed and about to be awarded in spring 2001 until the state budget impasse.

We view the V²U proposal as a systemwide initiative for the benefit of Virginia higher education. We also believe it would be a catalyst that complements and advances many of the concepts and ideas championed by the E-CVA. We certainly encourage and expect the E-CVA to continue its efforts, for there is still much work to be done in the area of distance learning, such as promoting best practices in online course development and shared resources.

The V²U proposal springs forth not from a desire for competition, but from the same spirit of collaboration that lies at the heart of E-CVA's ongoing success. For example, E-CVA's online catalog is a valuable resource that will be used extensively by V²U students and faculty to develop individualized learning plans. In addition, continuing the focus on getting resources for effective development of online content is an ongoing E-CVA goal. The V²U proposal will help by promoting the growth of virtual course offerings throughout Virginia. Nothing in the V²U proposal in any way inhibits any institution or consortia from delivering traditional degree programs completely online or via other distance learning modes. In fact, all Virginia institutions stand to benefit from increased course enrollments generated because of the V²U.

Distance education will continue to figure prominently in the visions that E-CVA and SCHEV share for a brighter future and a better Commonwealth. Recognizing that the V²U proposal offers a real opportunity for both expanded access and pedagogical innovation, SCHEV looks forward to working with E-CVA as the V²U proposal develops.

VIRGINIA DISTANCE LEARNING COST MODEL

This desire to reach out and collaborate with other agencies and institutions has led SCHEV to partner with faculty at George Mason University (GMU) and the University of Virginia (UVA) to develop an approach to costing online courses. While this approach or model is a separate initiative, it is one that is obviously relevant and involves issues impacting the V²U proposal.

Originally funded as part of a Mellon Foundation grant for work at GMU and UVA by Drs. John Milam and Steve Ruth, the Virginia Distance Learning Cost Model provides a complex and sophisticated framework to address the critical cost issues which impact the development of online courses and virtual university initiatives.

SCHEV recognizes the need for this type of planning and analysis, having set forth as one of its Top 10 Priorities “coordinating the efficient use of financial resources in the delivery of high-quality, higher education programs via distance and ‘e-learning’ technologies.”

The Virginia Distance Learning Cost Model uses a hybrid method with both “activity-based costing” (ABC) and “micro-costing” to examine traditional and online versions of the same course. The ABC features of the model are taken from the Flashlight Handbook, which was coauthored as part of the project (Ehrmann and Milam, 1999). The micro-costing components of the model are taken from the work of Jenny (1996), NACUBO, NCHEMS, and KPMG. It is consistent with the recent work of Dennis Jones (2001) and the Western Cooperative for Educational Telecommunications (WICHE) for the “Technology Costing Methodology Project.”

Three different versions of the model may be implemented: easy, standard, and full. The results in all three focus on two critical performance measures – cost per course section and cost per course credit hour for a traditional versus technology version of the same course. For analysis of program costs, multiple courses and other coordinating expenditures are aggregated. Using the model, planners may “tweak” various cost drivers to test their effect on the performance measures. For the full version of the model, these cost factors include the following data:

- Student and course enrollment
- Revenues (after institutional financial aid)
- Classroom/lab and office space utilization
- Opportunity costs (includes depreciation and maintenance)
- Faculty and staff workload
- Faculty compensation
- Direct and indirect computing expenditures
- Direct, non-computing expenditures
- Department, division, and institution-level overhead
- Program course offerings and coordinating expenditures

We intend to implement the first phase of the Virginia Distance Learning Cost Model in Fall 2001 with a survey of online courses that were offered in academic year 2000-01. Various data will be collected about all online courses, including instructor(s)

of record and personnel data such as faculty workload for the course section and the proportional amount of academic year instructional salary used for the course. Additional documentation of the model and its proposed implementation is available in separate documents.

TECHNOLOGY SUPPORT

Initially, we envision that web and database servers for the V²U will be housed and maintained at SCHEV. A web portal will be developed with complex navigation and search capabilities to meet the needs of different types of users. These servers also will be used to provide threaded discussion, listserv, e-mail, chat, messaging, and other online services used by V²U faculty and students. It is expected that an initial outlay of \$75,000 will be expended in the first year of the V²U for technology costs and that SCHEV will provide additional in-kind technology-related support.

As funding permits, it is possible that an outside service provider may be used to house the web and database servers and to support bandwidth requirements. It is recognized that this type of service is normally outside of the purview of SCHEV; though it should be noted that under the direction of SCHEV's Director of Research and Technology Services, the agency already provides significant and complex web support services statewide. Whichever solutions are developed for support, they will address issues of security, archival storage of student records, FERPA protections, accessibility, bandwidth, etc.

FINANCIAL AID

One of the greatest impediments to the development of virtual universities has been existing federal financial aid policies. Since SCHEV has statutory authority for Virginia financial aid programs, it is possible to develop creative financial aid policies that will better serve online students pursuing higher education.

Currently, students who take courses at different institutions during the same semester do not qualify for financial aid because they are not recognized as full-time students at any one institution. Under the V²U proposal, we envision these full-time students being able to apply to the V²U for financial aid and, if eligible and awarded, the V²U will parcel out the financial aid package to multiple institutions as appropriate in third-party contracts.

This scenario would work as follows. An undergraduate working towards a bachelor's degree in individualized studies creates a learning plan where she takes two regular classes at a community college, one online course at a Virginia institution, and a fourth course online with an out-of-state institution. The V²U faculty will help calculate the combined cost and advise the student through the financial aid application process. For all intents and purposes, the student will be full-time at V²U. V²U will then pay proportionately the financial aid monies to the three institutions, after deducting its own charges. As at traditional institutions, safeguards will be in place to address issues of changes in student status and prevent fraud and abuse.

COST OF THE PROPOSAL/BUDGET IMPLICATION

As one of its systemwide budget recommendations to the Governor and General Assembly for the 2002 Session, SCHEV is expected to ask for \$375,000 in state general funds for each year of the 2002-2004 biennium (including the equipment purchase) for the initial creation and staffing of the V²U proposal. The Council is expected to act on this proposal at its meeting on October 16.

This proposal is based on an entrepreneurial, incubator-type approach to creating a new quasi-public institution from scratch. The funding model is radically different than what many people expect because the proposal is dramatically different. It is expected that the V²U will be run much like a start-up business -- growing only as enrollments permit. The initial funding will allow for equipment and software purchases for the web and database servers as well as for offsetting personnel costs for the V²U Director and other part-time faculty and staff. This funding shall be considered seed money, whereby, at some point in the future, the majority of the funds would phase-out. Additional seed monies will be sought from business and industry. In addition, there may be a requirement for financial aid funds to support the need-based enrollments at V²U.

One reason why the V²U proposal is lean is that team members Tod Massa of SCHEV and John Milam of UVA have extensive experience in building complex websites, web-based data warehouses, and reporting systems. The V²U is not building a statewide learning portal or online catalog from scratch. Rather, it will create numerous web applications that facilitate faculty-student interaction. With the experience and vision of Massa and Milam driving this implementation, the web development costs are expected to be much less expensive than if vendors were used. Their vision of effectively leveraging existing and relatively inexpensive technology is critical to the implementation of the V²U.

Another reason why the V²U proposal is so lean in infrastructure is that its information system is going to be built around institutional research reporting and assessment from the ground up. No transaction-based system is needed to manage class rolls or grade assignment or employee benefits. The operations side of the enterprise is almost non-existent. The focus is on reporting for management information and assessment, all driven from web applications which Massa and Milam have already put in place in other contexts. Also, because SCHEV is involved, it will be clear from the outset how reporting of student FTE and other data for library resources, identity management, and performance agreements will be built into the V²U applications.

Whereas much larger funding is needed for the vision of portal development that SREC's "Ways-In" project, the original plan for the California Virtual University, and efforts other states have put forward, the V²U initiative is surprisingly less costly because it focuses only on promoting educational brokering. This proposal, however, is not primarily a software solution. It is an entirely new type of streamlined institutional structure that effectively leverages existing technology with a composite faculty role. Much of the infrastructure that costs so much in traditional higher education, such as student services, human resources, and library access, will be outsourced, in some cases to other public Virginia institutions and in other cases to business and industry.

Significantly, the V²U model is predicated on partnerships with business and industry to be “vendor-centric” as well as “student-centric.” A number of vendors already have expressed interest in partnering with the V²U. It is expected that additional funding will come from these partnership and sponsorship arrangements.

SCHEV will bear some of the in-kind costs associated with developing a new quasi-public institution. These include technology hosting, documented above, and assisting in navigating the complexities and legal issues of accreditation and enabling legislation. It is certainly recognized that the accreditation process is a difficult and long road. We also are aware that SACS historically has been viewed by many as more traditional in its approach to distance learning than other regional agencies such as North Central, which accredited Jones International University. However, we believe that the SACS criteria for accreditation, especially the adoption of the WICHE principals about distance learning, provide sound though untested support for the V²U model.

Although there are some with concerns about this proposal and the process by which has arisen, there also has been a great outpouring of interest from higher education faculty and staff and other Virginians in volunteering to help build the new V²U. There is a noticeable excitement and interest in helping Virginia create an alternative e-learning solution that will be on the cutting edge – effectively leveraging technology and challenging the existing paradigm of higher education. From navigating the complexities of applying for SACS accreditation to designing the best model for individual learning plans, we expect to get – and already have been offered – in-kind support of the V²U from many sources. This entire process follows the nature of how the Internet itself has evolved and works today, creating new open source networks of people across the state and country to share resources.

As the V²U evolves, it is implicit that its staff will make effective and efficient use of distance learning professionals in and throughout the Commonwealth and beyond. One idea that is being developed is to host a series of statewide planning conferences, in which faculty, students, and other Virginians have the opportunity to help create aspects of the V²U. Specific sessions could focus on building partnerships for outsourcing, models for individualized studies plans, and position descriptions for the new faculty role. There will be many such opportunities for Virginia’s distance learning professionals to help leverage technology and share the vision for the V²U model.

Adhering once again to the principles of collaborating with Virginia’s colleges and universities and encouraging institutions to be entrepreneurial and innovative, SCHEV has sought outside assistance in the development of this proposal. Dr. John Milam of the Center for the Study of Higher Education at the University of Virginia has been designated by SCHEV as the initial director of the project to help develop the conceptual design and program proposal for a Virginia Virtual University. UVA’s Curry School of Education has agreed to make an in-kind contribution of up to 25% of Dr. Milam’s salary for his work on the V²U project, for which SCHEV is extremely grateful.

For more information, please contact SCHEV at (804) 225-2600 or:

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ATTACHMENT A

Knowledge Chunks

“What We Know About Learning”

Herbert A. Simon
Department of Psychology
Carnegie Mellon University

<http://civeng1.civ.pitt.edu/~fie97/simonspeech.html>

“First, the expert possesses a large indexed memory in the area of expertise. In every field that has been investigated, the expert has a minimum of about 50,000 to 100,000 "chunks" of knowledge. "Chunk" is a technical term in psychology, meaning any unit of knowledge that has become familiarized and has a place in the memory's index. As it has a place in the index, a chunk is anything you can recognize in your field of expertise. English speakers are experts on the English language — we have stored over 100,000 familiar chunks, which are called words. When we see them in a text, we recognize them and retrieve their meanings from memory.

Now what does "index" mean? An index is a set of patterns that enable you to recognize things about which you have knowledge, whenever they appear. It's no use to have knowledge unless you can get access to it when it's relevant; and getting access to knowledge when it's relevant uses the process we call recognition. If you say "Hi, mom" and someone says, "How did you do that?" you reply, "Well I can recognize my own mom!" We're not very good at telling what features we saw in order to recognize her but we can be sure of the act of recognition.

It has been shown by studies of numerous fields of expertise that a large part of the skill, of say, a doctor when you walk into the office is simply the skill of recognizing patterns. Sometimes we use a fancier word: we say that we do it by intuition. Intuition is essentially synonymous with recognition. Having an intuition means you get knowledge about something without quite knowing how you did it: without knowing the underlying process. Usually, intuitions come rather suddenly, and somebody says "How did you know that?" and you say "Oh I had an intuition." You would sound a lot less mysterious if you just said, "Oh I recognized it. I recognized that chunk." And having recognized the chunk you do just what you do with the index of an encyclopedia: you get access to all those things you know about it, stored in your brain. That's one large part of what expertise is all about.”

“GSU Master Teacher Program: On Learning Styles”

Harvey J. Brightman
Georgia State University

<http://www.gsu.edu/~dschjb/wwwmbti.html>

“In a seminal study, George Miller noted that people can hold 7 + 2 chunks of knowledge in their minds at any given time. If each knowledge chunk contains a specific fact, then the amount of knowledge possessed is limited. But if each chunk contains many interconnected facts, a network or framework of facts, then the amount of knowledge is almost unlimited.

ATTACHMENT A (CONT.)

Introverted students want to develop frameworks that integrate or connect the subject matter. To an introvert, disconnected chunks are not knowledge, merely information. Knowledge means interconnecting material and seeing the "big picture."

Faculty should teach their students how to chunk, or group and interconnect, knowledge. Introverted students will appreciate it, extraverted students may not. Nevertheless, cognitive psychologists tell us that through chunking, students master the material. We recommend that faculty teach students how to build a compare/ contrast table, flowchart, or concept map."

"Tools of Ignorance, Tools of Knowledge"

Michael Cole

<http://www.panix.com/userdirs/broccole/NWDSK/Fire2/toitoc.html>

"Like so many things in life, there is magic in the mundane. The simple, exposed act of creating knowledge is a promising target for knowledge technology. Critically, this exposed creation event can be recorded. The input information, the comments and conclusions, and the relationship between them are all available for capture. The structured relationship between individual units of information ensures that all information and reasoning about the information is always presented in context. This means that someone other than the author can look at the whole as well as the components and apply the information, reasoning and conclusions of the author in a new context - precisely because the new user can apply their own knowledge to reason about the elements and processing provided by the original author. So this knowledge, properly captured, is reusable across the enterprise in ways that no mere collection of documents can ever hope to be.

Other, powerful, advantages of this approach emerge in connection with the extensibility of the portable knowledge 'chunk.' The original author, or someone else, can return with new information, insert it into the 'chunk', and consider the impact of the new information on the detailed reasoning, comments and conclusions. It is not simply a matter of the ease with which new information can be integrated and the knowledge updated. Since the entire basis for reasoning is available, the chunk of knowledge can be extended with confidence. This is essential for any knowledge technology that claims to enhance reusability across the enterprise – the tool must accept responsibility to support judgments of relevance and confidence by users other than the author. It should be noted that even knowledge published by the author for immediate use suffers from this 'confidence and reinterpretability' problem. In decision making processes that have several levels of review, and especially in cases with strategic implications for the firm, issues that are not explicitly part of the original scope of consideration for the author may nonetheless play an important role in the ultimate decision. A board member using the report probably has a broader set of issues, or a specific prioritization of issues, that could not be known by the author when the report was created.

Improving ROKI and the Knowledge Business

Return on knowledge investment (ROKI) is becoming an important issue for managing the knowledge-based enterprise. A recent study by CFO magazine looked at the value of the knowledge capital in large enterprises across a number of industries. It found that between 30% and 50% of the market capitalization of those firms was knowledge capital. In nearly every case the value of the knowledge capital in the firm far outweighed the book value.

ATTACHMENT A (CONT.)

At the same time, there is a general sense of despair about the possibility of determining the specific value of individual pieces of knowledge, except in rather special, but important, intellectual property cases, such as patent portfolios, licenses, etc. There is no doubt that most of the production of knowledge workers is not captured or measured by traditional management tools.

The capture of specific knowledge is relevant to ROKI in two ways. First, the knowledge can be better exploited across the enterprise, so it improves total ROKI. Just as importantly, the systematic capture of this knowledge into portable units allows the possibility of management systems that can measure, in a limited but useful way, investment in specific pieces of knowledge. At the same time the use of that knowledge can be tracked throughout the enterprise. Watching its use in business processes connects the specific knowledge to some measurable benefit to the enterprise.

Chunks of knowledge can be reused in ways that the usual knowledge output, i.e. publications, cannot. This suggests that ROKI can be improved, perhaps dramatically. More importantly, the ability to identify and manage specific pieces of knowledge allows measurement of inputs (how much did it cost to acquire the information?, how long did it take to create the structured information?), and track its use throughout the enterprise (how often has it been referenced? how has it been used? in which business processes?). Valuation of each chunk of knowledge is still nontrivial, and the basis of valuation will properly differ from enterprise to enterprise, but the key point is that capture of this knowledge enables an accounting for the costs and benefits of specific pieces of knowledge capital that today cannot be identified, much less measured.

Ultimately, the valuation of knowledge makes sense only from the perspective of its participation in business processes. Knowledge has value exactly to the degree that it can be used to create value for the enterprise. Businesses may well find that significant investments in knowledge acquisition and maintenance are not being used or, more likely, are underexploited.