The Virginia Longitudinal Data System

The Virginia Longitudinal Data System (VLDS) is a powerful new collection of tools allowing access to data held by multiple agencies in order to study the behaviors and transitions of students through the public school systems through college and into the workforce. The VLDS creates the possibility of tremendous analytical capability in the Commonwealth, giving Virginia leaders the ability to create education and workforce policy based on consistent and relevant data instead of using dissimilar data as has been done historically.

The VLDS has limitations that are explained in greater detail later in this document, the most important of which is that not all Virginia graduates are captured by the VLDS. Because of these limitations, the State Council of Higher Education for Virginia (SCHEV) strongly cautions reviewers not to use these data to measure the quality or long-term effectiveness of any of Virginia’s individual institutions. Instead, reviewers should use these data to develop a deeper understanding of the different routes Virginia's students take into the workforce.

Statewide Perspective

Stakeholders have long known that Virginia’s system of higher education is an important contributor to the Commonwealth’s workforce. Through the VLDS, the capability exists to examine the important transition from Virginia student to worker in greater detail. VLDS reveals that, between 2005 and 2011, there have been approximately 7.1 million unique individuals working in the Commonwealth who earned just over $1 trillion ($1,071,094,896,806) in positions reported to the Virginia Employment Commission. Since 1992, 3.9 million unique individuals have enrolled as students at a Virginia public or nonprofit college or university, and 2.25 million (58%) of these individuals have worked in positions reported to the Virginia Employment Commission earning nearly $400 billion ($393,281,081,209) since 2005. This is a significant economic impact.

History of the Virginia Longitudinal Data System

The VLDS is a work in progress that was begun in 2005 by Virginia's P-16 Council through its Working Group on Comprehensive Data Systems chaired by Dr. Virginia McLaughlin, Dean of the School of Education of the College of William and Mary. The P-16 Council produced a 2006 Report to the Governor and General Assembly. Below are the specific recommendations from the Comprehensive Data Systems group contained in that report:

1. Work with the Office of the Attorney General, SCHEV and DOE to identify any barriers to appropriate sharing of data, with adequate safeguards, under state or federal laws. Current status: Accomplished by the VLDS team.

2. Support the Board of Education (BOE) regulation to require unique student test identifiers on high school transcripts. Current status: Accomplished.
3. Address privacy concerns by incorporating appropriate safeguards into the legislation, related regulations and restricted-use protocols. *Current status: Accomplished by the VLDS team.*

4. Continue to monitor the Commonwealth’s progress in implementing the ten essential elements of the Data Quality Campaign. *Current status: Accomplished, all 10 elements are in place.*

5. Create a steering committee of key constituents to guide ongoing development and implementation of Virginia’s P-16 data system. *Current status: The P-16 Council was not continued past its 2008 sunset date, however the VLDS team has continued the intent of this recommendation.*

6. Work with the BOE and State Superintendent to engage local school boards and administrators in P-16 data system implementation. *Current status: With the sunset of the P-16 Council, this responsibility is left to the BOE and the State Superintendent.*

7. Work with SCHEV and VCCS to involve key leaders in higher education in P-16 data system implementation. *Current status: Accomplished by the VLDS team.*

8. Invest in ongoing sophisticated analyses of the effectiveness of Virginia’s education system with particular emphasis on smooth transitions from one level to the next. *Current status: The only investment thus far is the award of the grant by United States Department of Education (USED) funding the VLDS.*

These recommendations provided a road map to create the foundations for the VLDS even as some data collection was already in progress.

SCHEV first established its postsecondary data system, which is longitudinal by design, in 1992. The Virginia Department of Education (VDOE) began establishing a statewide longitudinal data system in 2002. The P-16 Council’s 2006 Report provided the impetus for SCHEV and the VDOE to continue the work of building a political and legal environment where data could be shared among state agencies in a manner consistent with the Family Educational Rights and Privacy Act (FERPA) and Virginia’s Government Data Collection and Dissemination Practices Act (GDCDPA).

In the summer of 2009, SCHEV and VDOE staff worked with the Office of the Attorney General to develop a model data-sharing agreement that overcame even the most knowledgeable concerns. In this model, both agencies would work together under a mutual contract to create a high-school-to-college dataset using a de-identified approach to protect students’ identities. This required the two agencies to identify specific data needed from each agency and the common student identifiers that would be used for the match. Then SCHEV and VDOE agreed upon a specific method to translate the identifiers into strings of characters (called “hashed-identifiers”) that could not be reversed to the original identifiers. Once the datasets were prepared, they would be provided to an independent third-party under contract with the two agencies that would match the data and create new, random identifiers for each record and remove the hashed identifiers. Once this was done, the datasets were returned to the agencies where they could be used for longitudinal analysis. No student in either dataset is readily identified by agency personnel, nor can the combined data be added to
databases in either agency to match against identifiable records.

The authority to perform this complex merge was provided in language from the Appropriations Act, which was due to expire with the biennium beginning July 1, 2010. In light of this, Delegate Robert Tata of Virginia Beach carried HB 7, which provides ongoing authority for such matches and included the Virginia Employment Commission within the authority. The bill passed both houses without objection and was signed into law by Governor Bob McDonnell.

A little-known, but critical outcome of this agreement was that it allowed the Commonwealth to commit to the requirements of the American Recovery and Reinvestment Act (ARRA) State Fiscal Stabilization Funds (SFSF) that directed approximately $4 billion to the state. The commitment in question was the "development and use of pre-K through post-secondary and career data systems" which would not have been possible in Virginia without this agreement and authority. Tied to this commitment is a required annual indicator: SFSF Indicator (C) (12) - A report on the number and percent of graduates in a Federal Graduation Indicator (FGI) cohort who enrolled in a Virginia public postsecondary Institution of Higher Education (IHE) within sixteen months of their high school graduation and completed one year of college credit within two years of their postsecondary enrollment date. Virginia was one of the few states able to meet this requirement by the original deadline, which ultimately had to be extended because so many other states reported an inability to meet the requirement on schedule. Virginia's reports can be viewed here.

Overlapping this effort was an activity initiated by Gail Robinson, Deputy Advisor to Governor Kaine for Workforce Development. Ms. Robinson brought together representatives from the education and workforce community in Richmond to prepare for an anticipated Request for Applications (RFA) from the USED. This group also wanted to pursue the creation of a workforce-education data system. However, the RFA ultimately asked State Education Agencies to create State Longitudinal Data Systems of K12 data with postsecondary data, and if possible, linkages to workforce data, making the workforce component a very small portion of the grant. However, the relationships formed within this initial group laid a solid foundation for Virginia's successful submission in the 2009 ARRA State Longitudinal Data Systems grant competition. The application resulted in a $17.3 million award, parts of which were used to create and implement the VLDS.

Launched in 2012, the VLDS project was developed through a partnership among the Governor’s office and Virginia’s education, workforce, and information technology agencies to propel Virginia’s data collection, reporting, and analytic capabilities far beyond current capacities. The three primary outcomes of the grant related to the VLDS are stated below:

Create a longitudinal data linking and reporting system with the ability to link data among state agency data sources, including K-12, higher education, and workforce systems. Using a federated system to merge data across agencies, we will: develop a rubric to document data element definitions, data requirements, and technical requirements for de-identified data sets that can be linked among agencies; build a central linking directory based on data sharing agreements in place or established as part of the grant project; and establish a query process for authorized user access that uses the linking directory to anonymously join individual-level records from multiple data sources.
Develop a web-based portal to provide one-stop access to education and workforce data by policymakers, educators, the public, program directors, researchers, etc. To increase the accessibility of existing data, we will develop a portal with different levels of access for publicly available data and reports, as well as access to non-public data for authorized users.

Design a data management and control system that enables us to maximize data quality, ensure accessibility with appropriate security, and enhance the usefulness of the data in both existing and proposed systems. We will develop and implement comprehensive cross-agency data sharing policies and practices and standards for data exchange, as well as data security measures that maintain privacy of personally identifiable information, and clear protocols for role-based data access at all levels. We also intend to enhance existing data audit systems to improve data quality, validity, and reliability.

An example of the intended use of the VLDS can be found in the Virginia Higher Education Opportunity Act of 2011, a legislative outcome of the Governor's Commission on Reform, Innovation and Investment in Higher Education also known as TJ21. This groundbreaking legislation requires the development and use of various economic opportunity metrics. The purposes of these metrics include assessing degree programs, and providing useful information on degrees to students as they make career choices, and to state policymakers and university decision-makers as they allocate scarce resources. The type of metrics cited in TJ21 include "marketplace demand, earning potential, employer satisfaction, and other indicators of the historical and projected economic value and impact of degrees." Through the VLDS, stakeholders are able to match postsecondary awards of degrees and certificates to Unemployment Insurance Wage records from the Virginia Employment Commission (VEC) and calculate accurate metrics of wage outcomes of graduates to a variety of aggregations.

It is this capability which features prominently in HB 639, legislation passed in Virginia during the 2012 session. This law requires SCHEV to publish annually on its website data regarding the employment outcomes of graduates from Virginia public and private, non-profit colleges and universities. At a minimum, the data will report at the program level (six-digit CIP and degree-level) on the percentage of graduates known to be employed within the Commonwealth, the average salary, and the average higher education-related debt for the graduates on whom the data are based. While the Virginia Community College System (VCCS) has published similar data on a limited basis, the reporting required by this law will be the first done on a statewide basis, and will also be the first in the nation to include private institutions.

The VLDS is not just about reporting graduates’ wages and earnings. While important, the real value of the system derives from the ability to study the transitions of students from one level to another. The VLDS will provide the Commonwealth with a rich set of data tools to help leaders develop policies to improve high school graduation rates and postsecondary education attainment.
Limitations of the Virginia Longitudinal Data System

Reviewers of this data must take into consideration the following caveats regarding the VLDS: the data reflects only post-graduation experiences of alumni who remain in the Commonwealth and take positions subject to protection by Virginia’s unemployment insurance, the data does not include federal workers, contractors, and others not covered by Virginia’s unemployment insurance; local economies may have a profound impact on wage outcomes; the relationship between a specific area of study and the career one pursues is not always clear; and the decisions of graduates are highly individual and varied. Because of these limitations which are detailed blow, SCHEV strongly cautions reviewers not to use the short-term wage outcomes of recent graduates to measure the quality or long-term effectiveness of any of Virginia’s individual institutions.

Not all Virginia Graduates are Captured by the VLDS

The data reported here provide only basic facts about the immediate post-graduation experiences of alumni who remain in the Commonwealth and enter its workforce. Notably, the reported wage data covers only 48% of recent graduates of Virginia’s public and non-profit colleges and universities with four-year bachelor degrees, of which approximately one-fourth are excluded as having part-time wages. Also not reported are many alumni currently enrolled in graduate or professional schools in institutions outside of Virginia, as well as those who are self-employed, in federal government service (including the military), or engaged in other endeavors excluded by Virginia employment regulations. Graduates of for-profit colleges and universities are also not reported as they do not participate in the Tuition Assistance Grant or other forms of state-funded student assistance, and therefore, are not required to submit student-level data to SCHEV.

Post-Completion Wage Outcomes

The 2012 General Assembly passed HB 639 into law, mandating that SCHEV annually make specific post-graduate employment data available on its website:

§ 23-9.2:3.04. (Expires June 30, 2017) Post-graduation employment rates. By August 1, 2013, and each year thereafter, the State Council of Higher Education for Virginia shall publish data on its website on the proportion of graduates with employment at 18 months and five years after the date of graduation for each public institution and each private nonprofit institution of higher education eligible to participate in the Tuition Assistance Grant Program. The data shall include the program and the program level, as recognized by the State Council of Higher Education, for each degree awarded by each institution and shall, at a minimum, include the percentage of graduates known to be employed in the Commonwealth, the average salary, and the average higher education-related debt for the graduates on which the data is based. The published data shall be consistent with the Government Data Collection and Dissemination Practices Act (§ 2.2-3800 et seq.) and the federal Family Educational Rights and Privacy Act (20 U.S.C. § 1232g).

To begin meeting these requirements, SCHEV utilized the VLDS to develop the data for the wage outcome reports, which were first published in fall 2012. SCHEV surpassed the minimum requirements of the law, developing a dataset to support wide research into the relationship between postsecondary experience and wage outcomes. The key to understanding SCHEV’s approach is this: Wages are only a piece of the puzzle.
While we are very interested in a graduate's earnings after completing a degree, that information most likely does not say much about the graduate's educational experience. It may tell us more about the economy (local, state, and national), the specific relationship between a college major and the job market, and the decision-making of the graduate.

**The Economy**

Reviewers of these data must understand the overall nature of the institution, degree level, and program. There is no question that many Virginia institutions have specific service areas, particularly the community colleges, as they were established to have local missions. Their students may be place-bound in that they cannot or choose not to leave the area because of family or other obligations. Thus their wage outcomes are highly dependent on the local jobs available. Eastern Shore Community College and Mountain Empire Community College, for example, are part of long-term efforts to educate students in ways that meet local needs and therefore help stimulate the regional economies.

Place-bound students at the bachelor’s degree level are less common, but they do exist. A larger issue is that bachelor’s degree students are generally the opposite of place-bound. Those that are not local to a particular institution may return to the area in which they grew up, they may pursue graduate school, whether in-state or out-of-state, or follow jobs across the state or beyond. Graduates at this level are often very mobile and have been encouraged to be so.

The post-bachelor’s degree level is an interesting mix. Some programs are clearly designed to meet local needs for continuing professional development. Therefore, the wages of graduates of those programs often are tied to the local economy. In contrast, doctoral and first professional degrees in law and medicine are programs that produce graduates for the national and international marketplace, making these graduates highly mobile.

Master’s degree programs easily can be seen as meeting national market interests, but many programs also have strong connections to local economies. Examples of these include the master’s of arts degrees in teaching, business administration, public administration (particularly in the Richmond area), and various IT-related programs.

In short, it is difficult to underestimate the impact that local economies may have on the wage outcomes in these reports.

**College Major and the Job Market**

It is no secret that some college majors are highly sought after in the job market, while others are not. For bachelor’s degree recipients, physics majors with a K-12 teaching license have no difficulty finding teaching positions. The same is true for math majors and a handful of other sciences. Finance majors and chemical engineers are often highly sought after, as well. In these examples there are clear relationships between study and career. These are also fields that do not draw large numbers of students and thus produce relatively few graduates.
For many majors the relationship between what one studies and the career one pursues is much less clear. In fact, college major is irrelevant to many occupations. This is due in part to the emphasis on critical thinking, problem-solving, communication, and other foundational skills that students traditionally learn at the bachelor’s level.

Approximately half of the typical bachelor’s degree is dedicated to general education. A 1999 SCHEV report, *General Education in Virginia: Assessment and Innovation – A Challenge to Academic Leadership*, noted four themes emerged from the analysis of the formal statements institutions had developed regarding their general education programs. Such programs endeavored to:

- provide foundational knowledge and basic skills to prepare the student to pursue a major and professional programs;
- enable the student to synthesize information and to make connections across disparate fields of study;
- form a basis for the student to become an informed and productive member of society; and
- inculcate in the student a desire to become an active and lifelong learner.

When general education is effective, these guiding principles create graduates who can be effective in almost any workplace. Specific knowledge requirements for professional or technical practice are then added through coursework in a student’s major.

The courses required to complete a modern college major typically consume between a quarter and a third of the total degree (between 30 and 40 credit hours). In an ideal progression, a student does not begin encountering the courses dedicated to the major until towards the completion of the general education component. This provides the student the opportunity to engage in the study of a major with a full complement of tools (critical analysis, reasoning, quantitative and qualitative skills, etc.), that were learned through general education. Simultaneously, the in-depth study of a topic (such as biology) sharpens and expands these tools through practice and critical evaluation by the faculty.

Graduates with bachelor’s degrees therefore are able to apply the many skills acquired through higher education to occupations and careers that have no apparent relation to their college majors.

*Decision-Making of Individual Graduates*

Students tend to make the choices that best fit their situation at a given time. After completing a degree or certificate at one of Virginia’s colleges or universities, a new graduate may take many different paths, some of which might not seem to make the best economic sense to others, at least in the short term. Following graduation, students might go directly into volunteer programs such as the Peace Corps or Teach for America. Others may choose opportunities in community service agencies out of a personal calling or to gain new experiences for a year or two prior to graduate school. Still others may work multiple minimum wage jobs to fund a long-term adventure such as the hiking the Appalachian Trail. These are just a few examples of what graduates might do if they decide not to move directly into the highest paying job they can find.

Virginia higher education is not, and has never been, solely about producing well-fitted cogs for the workplace. One can see evidence of this in the missions and histories of our colleges and universities. The
following examples were selected for their clarity in expressing the values of undergraduate education that
go beyond pursuit of high wages and the material aspects of lives, without devaluing those aspects.

Ferrum College
“It is our mission to educate students in the disciplines of higher learning and to help them be
thoughtful and perceptive, to be articulate and professionally capable, and to be caring and concerned
citizens of their community, nation, and world. We therefore commit ourselves to developing the
whole student, both in openness to a wide range of intellectual discovery, and in the physical,
spiritual, and social aspects of life.”

James Madison University
“We are a community committed to preparing students to be educated and enlightened citizens who
lead productive and meaningful lives.”

Roanoke College
“Roanoke College develops students as whole persons and prepares them for responsible lives of
learning, service, and leadership by promoting their intellectual, ethical, spiritual and personal
growth.”

Virginia Military Institute
“It is the mission of the Virginia Military Institute to produce educated, honorable men and women,
prepared for the varied work of civil life, imbued with love of learning, confident in the functions and
attitudes of leadership, possessing a high sense of public service, advocates of the American
democracy and free enterprise system, and ready as citizen-soldiers to defend their country in time of
national peril.”

As students complete degrees at these and the other Virginia institutions, it should not be surprising that
some begin post-college life employed in the public service sector, which notoriously may offer lower starting
salaries than private sector jobs. Nor should it be surprising or troubling that some graduates find their own
pathways that defy traditional expectations. There is not one correct definition of success, nor is there a
single correct path to get there.

Future Reporting

While the initial reports released in 2012 shed light on the near-term outcomes of college graduates who
have completed specific credentials or degrees, they are not the final word by any means. These are simply
the first steps to developing a meaningful model. In 2013, SCHEV will add information on student debt to the
web reports at the program and degree level as is required by HB 639.

We hope to gain access to wage data on federal employees and military service members in the near future
to improve our level of knowledge of wage outcomes. We also hope to acquire funding to allow us to use the
National Student Clearinghouse to improve what we know about students who continue their enrollment
outside Virginia.

Of even greater importance, SCHEV will work with its partners in the VLDS to make data available to properly
credentialed researchers who will study, on behalf of SCHEV, many of the factors that lead to successful
transitions from high school to college and into the workforce. We hope to be able develop these research partnerships in ways that transform how education policy is made in the Commonwealth. In the last few years, for example, there has been greater interest in reducing the time it takes students to complete a degree. This interest is primarily based on arguments of efficiency and access, but what has never been tested is whether or not increased time-to-degree leads to a positive increase in earnings. Effectively using VLDS data will allow Virginia leaders to conduct a more informed policy analysis of this and other issues in higher education, which can reduce unintended consequences for students, businesses, and citizens of the Commonwealth.