First Year Student Adjustment, Success, and Retention: Structural Models of Student Persistence Using Electronic Portfolios

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Abstract:

This study explores the deployment of electronic portfolios to a university-wide cohort of freshman undergraduates that included a subgroup of at-risk and lower academically prepared learners. Five evaluative dimensions based on persistence and engagement theory were included in the development of four assessment rubrics exploring goal clarity, support from friends and family, academic engagement, social integration, and quality of effort were used to assess student ePortfolios. Data collected from these five were integrated with institutional measures producing two structural equation models explaining undergraduate persistence for students returning with 2.5 and 3.2 GPAs with an explained variance of 31 and 39 percent respectively. Carefully designed interventions geared to assist students in continuing their studies as second year undergraduates are considered.

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Introduction, Purpose and Objectives:

As an emerging paradigm in higher education, digitized student portfolios (Yancey 2001; 2008) and computer learning environments (Azevedo 2005) have received considerable attention regarding their purported effects on teaching and learning (Carr, Skeele, and Middleton, 2007). This study examines the deployment of electronic portfolios to a university-wide cohort of freshman undergraduates that included a subgroup of at-risk and lower academically prepared learners.

As an academic unit, Freshman Studies provides a programmatic co-curriculum designed to assist students in meeting key personal, academic and professional/career goals with an aim to helping them become engaged as successful learners in college (Wolf-Wendel, Ward, and Kinzie, 2009). In an aligned manner, the co-curriculum intended to increase the effective use of technology using electronic portfolios (ePortfolios) through a mobile computing initiative (Landry and Stewart, 2005). The institution infused Freshman Studies core initiatives with ePorftfolios to deepen reflective thinking practice, effort, and student achievement goal orientations (Phan 2009a; 2009b) thereby promoting the success of college students (Chickering and Kuh, 2005) and student learning effectiveness using technology (Landry and Stewart, 2005).

As an assessment measurement device, electronic portfolios have been shown to "determine individual students' mastery of learning and support feedback for improvement" for the individual and institution alike (Knight, Hakel, and Gromko, 2008). For the student, well structured freshman ePortfolios provide a "place" to reflect on University experiences, adjust to academic and student life, and explore career aspirations, while for the University, ePortfolios supply an ample source of information to stem attrition (Sandler, Easterling, and Zedeck, 2008). Using 2006 freshman electronic portfolios, evaluative rubrics were developed to assess first year student experience supplying non-cognitive data as a means to address the research questions of the project.

Research Questions:

- What learning is taking place as a function of digital portfolios? How do we know?
- Can ePortfolios serve as a source of information concerning first year student experience?
- What can be learned from a systematic review of freshman ePortfolios?
- What learning is taking place as a function of digital portfolios?
- Will rubrics based on persistence theory produce meaningful data?
- Will ePortfolio data increase our ability to predict student persistence from first to second year?

(Wankel, Gottlieb, and Easterling, 2008; Sandler 2008)

Freshman Studies, University Life, Teaching, Learning and Technology Center and a Presidential Initiative:

Over a period of several years the curriculum of the University Life course for Freshman Studies evolved whereby in the fall of 2006 ePortfolio technology was in place to deploy a University Life coordinated curriculum for all freshmen electronically. The persistence/retention literature was deemed by the team of developers to provide the appropriate building blocks for a conceptual framework as clear links were associated with the goals and objectives of the University Life curriculum. Consultations with the University Registrar and Enrollment Management about an enhanced attrition warning system emerged out of a Presidential initiative that was communicated to the University community. The five rubrics developed for this study evolved from the "Pillars of Retention" presidential initiative (Appendix A) (Sandler, Easterling, and Zedeck, 2008; Sandler 2008).

After careful consultation with the Dean, Associate Dean and senior mentors of the Freshman Studies program and the Teaching Learning and Technology Center, the conceptual framework based on persistence theory was agreed upon for University Life assessment using ePortfolios. Interest in the career development in consultation with The Career Center emerged as academic and career goals became a central developing theme for the co-curriculum, reflected in the fall 2006 ePortfolio assignment (Appendix A) pertaining to the University Life curriculum.

At around this same point in time the University joined the third Cohort of the (I/NCEPR) International/National Coalition for Electronic Portfolio Research. This coalition brings together faculty from approximately ten campuses in successive cohorts. In a cohort, these ten institutions each design a campus-based research agenda, receive consultative feedback from the leadership of the coalition and professional workshops, and share peer feedback on portfolio learning goals and objectives. In turn each institution enacts their respective research agenda and timelines and participates in cohort/member presentations to ultimately report on their ePortfolio program initiatives, outcomes, and results over a two year period (Sandler, Easterling, and Zedeck, 2008; Sandler 2008).

Theoretical and Conceptual Frameworks:

Computer-based learning environments have become ubiquitous (Green, 1996) as students use them extensively in and out of the classroom in conceptually rich domains, involving a set of "complex interactions between cognitive, motivational, affective, and social processes" (Azevedo 2005). These complex interactions are integrally related to student adjustment (Chartrand 1992; Bean and Vesper, 1990), learning (Chickering and Gamson 1987; 1989), and persistence in college (Tinto 1993; Pascarella and Terenzini, 1991, 2005; Cabrera, Nora, and Castaneda, 1993; Kuh, 2001; Kuh, Kinzie, Schuh, Whitt, et als., 2005; Sandler 2000). Concurrently with an overlapping timeline, digitized student portfolios (Yancey 2001; 2008) have received considerable attention regarding their purported effects on teaching and learning (Carr, Skeele, and Middleton, 2007) and student persistence (Sandler, Easterling, and Zedeck, 2008; Sandler 2008).

Accordingly, as a means to evaluate freshman ePortfolios, student adjustment, and persistence, a team of researchers crafted four assessment rubrics that were derived from the persistence/retention literature (Tinto 1993; Cabrera, Nora, and Castaneda, 1993; Sandler, 2000). Each rubric was comprised of a four point scale that yielded eight (8) scores, from which five (5) evaluative dimensions/variables were prepared for quantitative analysis using structural equation modeling and path analysis (Sandler, Easterling, and Zedeck, 2008; Sandler 2008).

Five Evaluative Dimensions Based on Persistence Theory were Included Using Four Rubrics:

The integrated model of student persistence of Sandler (2000), the notions of goal commitment (Tinto 1993), academic and social of integration (Pascarella and Terenzini, 1991; 2005), academic engagement (Kuh 2001; Kuh, Kinzie, Schuh, Whitt, et als., 2005) and quality of student effort (Chickering and Gamson, 1999; Phan 2009a) were considered the principal theoretical components of the conceptual framework employed (Sandler, Easterling, and Zedeck, 2008). Five evaluative dimensions based on persistence and engagement theory were included in the development of four rubrics with antecedent reference made to the literature:

- Goal Clarity, academic and career goals (Tinto 1993; Sandler 2000)
- Perceived Support from Friends and Family (Cabrera, Nora, and Castaneda, 1993; Sandler 2000; Friedlander, Reid, Shupak, and Cribbie, 2007)
- Academic Engagement (Pascarella and Terenzini, 1991, 2005; Tinto, 1993; Sandler 2000; Kuh 2001; Kuh, Kinzie, Schuh, Whitt, et als., 2005; Wolf-Wendel, Ward, and Kinzie, 2009).
- Social Integration (Pascarella and Terenzini, 1991; 2005; Tinto 1993; Sandler 2000)
- Quality of Effort (Chickering and Gamson, 1999; Phan 2009a).

Methodology, Survey Administration, Population and Sample:

In order to elicit reflection and obtain student data for evaluation, an electronic portfolio assignment was developed for all University freshmen (1200 students) by a Freshman Studies Program. The assignment was administered by twenty-five (25) University mentors/lead instructors to fifty-five (55) sections of a University Life course (bearing one credit) taught with a uniform co-curricular syllabus at a private Catholic University in the northeast of the United States during the fall 2006 semester. By matching the total freshman student demographic and academic profile at the institution, a sample was determined to be representative of the Freshman population consisting of most University Schools, undergraduate divisions and departments, N=384.

Evaluator/mentor scores were derived as measures of student experience and were inferred from co-curricular exercises using electronic portfolios demonstrating evidence of 1) academic and career goals, and 2) student life and related activities. The initial crafting of the four assessment rubrics: 1) Goal Clarity, 2) Support from Friends and Family, 3) Academic Engagement & Social Integration, and 4) Quality of Effort was conducted by a research team of three. Two lead mentors provided further refinements of the rubrics in consultation with team developers before a formal evaluation was conducted by sixteen (16) mentors in two six hour scoring sessions.

Forty ePortfolios were scored twice by different mentors to determine scoring concordance during a preevaluation/testing phase by comparing the mean rubric scores and reliability coefficients of 40 electronic portfolios that served as the evidentiary content. The portfolios were structured around a term assignment while a template enabled students to build their electronic portfolios in fall 2006 with elements prescribed in the assignment and university life syllabus (Appendix A). After refinements were finalized at the conclusion of the pre-evaluation/testing phase, a cursory review of the means and reliability coefficients of the rubric scores provided a green light to proceed with two formal evaluation sessions. The same procedure was followed during the formal evaluation sessions when approximately 400 ePortfolios were evaluated in two six hour sessions in January 2008 and April 2008. The evaluations from the two sessions were merged upon which inter-rater reliability was confirmed.

Once the mean scores and reliability of the two independent evaluations of each ePortfolio were found to be in concordance, approximately 400 total ePortfolio evaluations were randomly selected from the two sets of each mentors' evaluations so that a single comprehensive set of the selected ePortfolios would be available for quantitative analysis. The total ePortfolios scored after listwise deletion, N = 366. Five dimensions of inquiry explored in the four rubrics comprised five endogenous variables in the study. Persistence/Return to study Fall 2 with a 2.5 Cumulative GPA and 3.2 Cumulative GPA (Fall 2007), a sixth, was added from institutional data.

Data Sources, Variables, Reliability, and Findings:

Twelve variables were included for analysis including six (6) endogenous variables described above. Six (6) exogenous variables were also included from institutional data to determine and control for student background.

Six Endogenous Variables:

Goal Clarity

Support from Friends and Family

Academic Engagement & Social Integration

Quality of Effort

Persistence, Returned Fall 2

Six Exogenous Variables:

Gender

Race/Ethnicity, Minority/Majority White (dichotomous)

NJ Resident (dichotomous)

SAT Math & Verbal Combined Score

HS GPA

Campus Resident/Computing Time

Data Analysis:

The sample included N = 384 rubrics scores collected from evaluations of freshman electronic portfolio content. Rubrics scored after listwise deletion, N = 366.

Preliminary descriptive, correlation and reliability analysis of the rubrics scores was conducted using SPSS 16. A demographic profile of the sample N=366 was determined to be representative of the freshman population of 1200 students during the fall 2006 semester. Preliminary analysis included four profiles; elements of the four profiles listed below can be found in Appendix A (Sandler, Easterling, and Zedeck, 2008; Sandler 2008):

Student Profiles
 Persistence Profiles

Rubric Score Profiles Correlation Matrix.

Reliability Analysis:

The utility of the use of the evaluative rubric data as a combined scale was considered as a possible direction for the research, but was deemed unnecessary and tangential to the structural analysis that followed. The actual scores from the evaluative rubrics for Goal Clarity, Support from Friends and Family, Academic Engagement, and Social Integration were employed as variables in the structural path model that followed.

• **Four combined rubric scores** (4 scores – Goal Clarity, Support from Friends and Family, Social Integration, Academic Engagement) Cronbach alpha reliability = .691, N=366.

After a Cronbach alpha reliability score was computed, the four scores that comprised the Quality of Effort variable were reduced using a principal components analysis to one orthogonal factor; varimax rotation produced one non-rated orthogonal factor. In turn, the Quality of Effort variable was included in the structural path analysis that followed as a single factor score.

• **Quality of Effort** (4 scores –fulfillment of assignment, organization, mechanics, readability/aesthetic) - Cronbach alpha reliability = .857, N=366.

Two Path Analytic Structural Equation Models:

With rubric and institutional data in a complete dataset, two path/analytic structural equation models were determined from the measurement models to explain students returning with a 2.5 and 3.2 Cumulative GPAs.

As a means to appropriately address the variable types that included ordinal, continuous and dichotomous measures, and to examine the non-recursive effects among variables and bi-directional effects between variables, structural equation modeling was conducted using LISREL 8.80 with a WLS estimator after a pretreatment phase using PRELIS 2.5 (Joreskog and Sorbom, 1993).

Results:

The explained variance for Perceived Support (R² 2.5=.150, R² 3.2=.125), Social Integration (R² 2.5=.235, R² 3.2=.225), Academic Engagement (R² 2.5=.097, R² 3.2=.091), Goal Clarity (R² 2.5=.106, R² 3.2=.083), and Quality of Effort (R² 2.5=.202, R² 3.2=.194), Persistence (R² 2.5=.314, R² 3.2=.394), for the two models explaining persistence with 2.5 and 3.2 GPAs respectively were respectable at low to moderate levels using evaluative data from student ePortfolios. These findings are indeed new to higher education particularly using advanced techniques like structural equation modeling where the non-recursive (bidirectional) path relationships among the variables were determined.

Describing the total effects of all six endogenous variables is beyond the scope of this paper, but the reader can trace these effects fairly well using Figures 1 and 2. The results presented will focus on the total effects on Persistence for students returning in Fall 2 with a 2.5 Cumulative GPA and 3.2 Cumulative GPA. The total effects on Persistence are primarily composed of direct effects as indicated in Tables 1 and 2 with the exception of the total effects of Goal Clarity which are largely composed of indirect effects in both models explaining persistence, meaning the total effects are mediated through an intervening variable(s). Nevertheless, due to the complexity of the bidirectional effects in both models, trying to determine the source or path of the indirect effects with regard to Goal Clarity can be very difficult to deconstruct. For the sake of making the data accessible, the tables presented use more informal reporting labels, providing parsimony in an informal manner, suggesting the "effects are mostly" direct or indirect in composition when reporting the total effects on Persistence.

Insert Figures 1 and 2.

Total Effects on Persistence:

As the standardized total effects indicate, for every unit increase of student persistence with a Cumulative GPA of 2.5, the following four variables served as predictors at low to moderate levels: Goal Clarity .135 (p < .001), Quality of Effort .235 (p < .001), Total SAT Math & Verbal combined .261 (p < .001), and HSGPA .356 (p < .001) producing an explained variance of .314 (Table 1).

Table 1: Model One Explaining Persistence with a Cumulative GPA of 2.5

1	R ² CumGP	PA 2.5	Primary Significant Total Ef	fects on	R^2	
	N=366		Return - Persistence Total I	Effects		
			Reduced R Square = 0.314			
						Effects are mostly
6	5 Endogenous		Goal Clarity	0.135	***	Indirect
			Quality of Effort	0.235	***	Direct
6	Exogenous		TSATMV	0.261	***	Direct
			HSGPA	0.356	***	Direct
	*p < .01	**p < .005	***p < .001			
	Goodness	of Fit: Chi-Squa	re with 48 degrees of freedom =	= 35.398 ((<u>p</u> = .91	12).

Goodness of Fit: Chi-Square with 48 degrees of freedom = $35.398 (\underline{p} = .912)$. Goodness of Fit Index (GFI) = 0.994, Adjusted Goodness of Fit Index (AGFI) = 0.990. Root Mean Square Residual (RMR) = 0.0387 (Joreskog and Sorbom, 1993). Similarly for every unit increase of student persistence with a Cumulative GPA of 3.2, the following four variables served as predictors at low to moderate levels: Goal Clarity .084 (p < .01), Quality of Effort 0.111 (p < .005), Total SAT Math & Verbal combined .296 (p < .001), and HSGPA .403 (p < .001) producing an explained variance of .394 (Table 2).

Table 2: Model Two Explaining Persistence with a Cumulative GPA of 3.2

2	R ² CumGPA 3.2	Primary Significant	Total Effects on R ²	
	N=366	Return - Persistenc	e Total Effects	
		Reduced R Square = 0.394		
				Effects are mostly
6	Endogenous	Goal Clarity	0.084*	Indirect
		Quality of Effort	0.111**	Direct
6	Exogenous	TSATMV	0.296***	Direct
		HSGPA	0.403***	Direct
	p < .01 $p < .005$	***p < .001		

Goodness of Fit: Chi-Square with 48 degrees of freedom = $25.625 (\underline{p} = .996)$. Goodness of Fit Index (GFI) = 0.996 Adjusted Goodness of Fit Index (AGFI) = 0.993. Root Mean Square Residual (RMR) = 0.0326. (Joreskog and Sorbom, 1993).

Discussion:

Two principal structural equation models were chosen to examine the differences observed in the explained variance of key endogenous variables and in particular for Persistence/Returned Fall 2 with a Cumulative GPA of 2.5 and 3.2 respectively. Each model produced close to a "perfect fit" as "Goodness of Fit" statistics indicate between the paths explored and the empirical data modeled (Table 1 and 2).

Twenty-three (23) total effect variable paths are included in the model explaining persistence with a GPA of 3.2, whereas twenty-one (21) total effect variable paths are found in the model explaining persistence with a GPA of 2.5 with effects < .08 trimmed in each model. Upon comparing structural models, the two models differ principally with respect to the addition of one endogenous path on Perceived Support from Quality of Effort (0.556, p. <.001) in the model explaining persistence with a 2.5 GPA, in fall 2007 plus one net additional exogenous variable path. In comparison, the total effect of Goal Clarity on Quality of Effort in the model explaining students' return/persistence with a 3.2 GPA was 31 percent or .180 standardized units larger than the alternate model, thus producing a more efficient outcome.

The fitted models, chi square values, and measurement error differ for the respective models. The model explaining persistence or return with a GPA of 3.2 has a better overall structural fit with a lower chi square value and higher probability. The level of explained variance for the criterion variable persistence/return is higher with

less total measurement error in the model explaining persistence with a 3.2 GPA. Despite this comparative distinction, both models explain persistence very well.

Interestingly in both models the TSATMV and HSGSPA bear the strongest effects on persistence at low to moderate levels adding to the debate about the SAT and the use of alternate indicators like HSGPA and rubric scores as a means to predict persistence. While the effect of the SAT and HSGGA were not among the primary purposes of this research inquiry, its presence in the structural model as a background or exogenous variable brings some interesting considerations with respect to the current debate concerning admissions testing, versus other indicators for making college admissions decisions, particularly with regard to the variance explained of Persistence at the two levels of Cumulative GPA used at 2.5 and 3.2. Effects like these provide fuel for debate about the appropriate use of the SAT in admissions decisions that have embroiled academe for some time.

While the debate is a most important one, the author refers readers to the literature and recent articles by Linn (2009) and Atkinson and Geiser (2009) so that the findings regarding the ePortfolios and evaluative rubrics used can be more centrally explored. This tact regarding the discussion of the results in no way diminishes the value of controlling for the SAT and/or exploring the effects of the SAT and HSGPA accordingly, or for that matter, exploring the subject of the SAT in higher education that examples like this research can help elucidate.

Conclusions:

As a possible explanation, students returning with a GPA of 2.5 may perceive greater support as a result of the quality of effort achieved. That is, these students may not be able to convert the support experienced as effectively into a persistence outcome, as compared to students returning with a 3.2 GPA. Tracing the effects in the structural path model is difficult to conclusively assert, but remains a possibility for further consideration.

More importantly, students in the first model persist with a lower level of explained variance due to the relative effects of the SAT and HSGPA on the Persistence between models. Interestingly, the endogenous model variables of goal clarity and quality of effort have a stronger impact in the model explaining persistence with a GPA of 2.5, giving Freshman Studies mentors a diagnostic tool for assessing and supporting student persistence behavior with GPAs at or below 2.5 with greater insight. A question remains though, if students with stronger effects of goal clarity and quality of effort are persisting at lower levels of explained variance with lower Cumulative GPAs, why may this be the case? Accordingly as the exogenous effects from both models indicate, the effects of the SAT and HSGPA, as background variables, determine stronger persistence outcomes for students persisting with 3.2 Cumulative GPAs, that is, higher levels of explained variance are evident for students persisting with higher Cumulative GPAs. Freshman Studies mentors can plausibly use evaluative rubrics diagnostically with a Registrar based alert system composed of GPA and other critical data, indicating the heightened possibility of withdrawal concerning students with these potential characteristics.

Linking electronic portfolios (Yancey 2008) and persistence models (Cabrera, Nora, and Castaneda, 1993; Sandler 2000) is new to higher education research bringing greater insight and refinement to key issues and underlying student beliefs. Assessment using rubrics based on theories and models in the persistence literature provide important quantitative measures such that practitioners and counselors can take steps to stem attrition using

electronic portfolios as a source of persistence data (Sandler, Fisher, and Zedeck (2008); Sandler 2008; Wankel, Gottlieb, and Easterling, 2008).

Carefully designed interventions geared to assist students to continue their studies are better equipped to help freshman focus on instrumental goals and a purposeful sense of self-efficacy to undergird their academic and career pursuits (Sandler 2000; Phan 2009b). This is a particularly important process that at-risk students and lower academically prepared learners need to acquire and practice (Friedlander, Reid, Shupak, and Cribbie, 2007) considering the support they receive from friends and family (Cabrera, Nora, and Castaneda, 1993; Sandler 2000).

By strengthening Freshman Studies co-curriculum and core initiatives with ePorftfolios that have an impact on student learning effectiveness using technology (Landry and Stewart, 2005), the institution has taken measureable steps to promote the adjustment, success and persistence of first year college students returning in the fall term of their second year (Chickering and Kuh, 2005; Sandler 2000; Wankel, Gottlieb, and Easterling, 2008), much in the same way the seven principles of good practice of Chickering and Gamson (1987) can affirm the benefits that an enriched "active learning" curriculum can have on at-risk and lower academically prepared students adjusting to the demands of college in the classroom during the first year (Braxton, Jones, Hirschy and Hartley, 2008).

References:

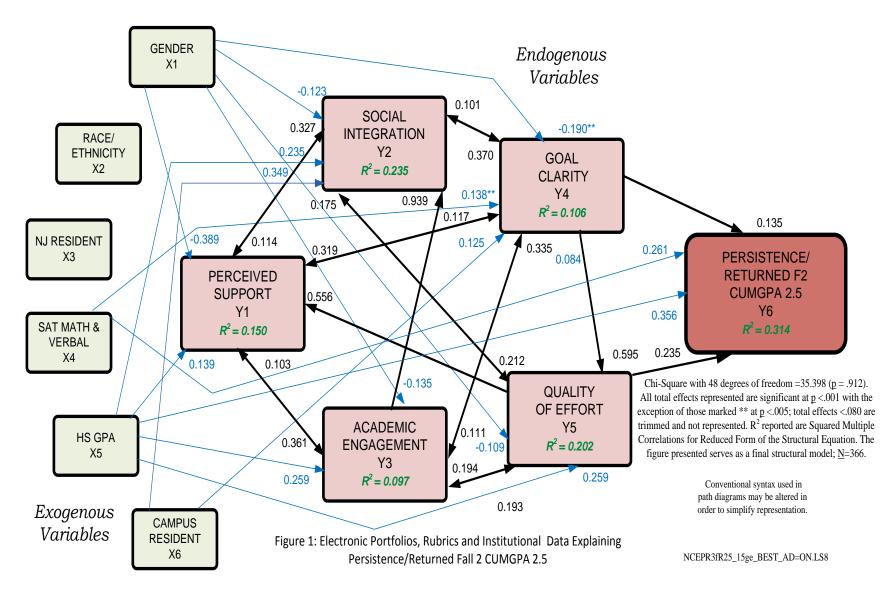
- Atkinson, R. C. and Geiser A. (2009). "Reflections on a Century of College Admissions Tests," <u>Educational</u> <u>Researcher</u>, Vol. 38, No. 9, pp.665-676.
- Azevedo, R. (2005). "Computer Environments as Metacognitive Tools for Enhancing Learning," <u>Educational</u> <u>Psychologist</u>, 40(4), 193-197.
- Bean, J. P. & Vesper, N. (1990). <u>Quantitative approaches to grounding theory in data: Using LISREL to develop a local model and theory of student attrition</u>. Annual Meeting of the American Educational Research Association, Boston.
- Braxton, J. M. Jones, W. A., Hirschy, A. S. and Hartley, H. V. (2008). "The Role of Active Learning in College Student Persistence." New Directions for Teaching and Learning, n115, p71-83, Fall 2008, Hoboken, NJ: John Wiley & Sons, Inc.
- Cabrera, A. F., Nora, A., and Castaneda, M. B. (1993). "College persistence: Structural equations modeling test of an integrated model of student retention." <u>Journal of Higher Education</u>, <u>64</u> (N2), 123-139.
- Carr, V. B, Skeele, R. W. and Middleton, D. W. (2007). "Electronic Portfolios Powerful Tools for Student Learning and Outcomes Assessment, ED-MEDIA, World Conference of Educational Multimedia, Hypermedia & Telecommunications," Association for the Advancement of Computing in Education.
- Chartrand, J. M. (1992). "An empirical test of a model of nontraditional student adjustment." <u>Journal of Counseling Psychology</u>, (39) (2), 193-202.
- Chickering, A. W. and Gamson, Z. F. (1987). "Seven Principles for Good Practice in Undergraduate Education." AAHE Bulletin; p. 3-7 March 1987.
- Chickering, A. W. and Gamson, Z. F. (1999). "Development and Adaptations of the Seven Principles for Good Practice in Undergraduate Education," <u>New Directions for Teaching and Learning</u>, no. 80, Winter 1999.
- Chickering, A. W. and Kuh, G. D. (2005). "Promoting Student Success: Creating Conditions so Every Student Can Learn," (Occasional Paper No. 3). Bloomington, IN: Indiana University Center for Postsecondary Research.
- Friedlander, L. J., Reid, G. J., Shupak, N., and Cribbie, R. (2007). "Social Support, Self-Esteem and Stress as Predictors of Adjustment to University Among First-Year Undergraduates." Journal of College Student Development, 48, 3, May/Jun 2007.
- Green, K. C. (1996). "The Coming Ubiquity of Information Technology," Change, 28(2): 24-28.
- Joreskog, K. G., and Sorbom, D. (1993). LISREL 8, Scientific Software International, Inc., Lincolnwood, IL.

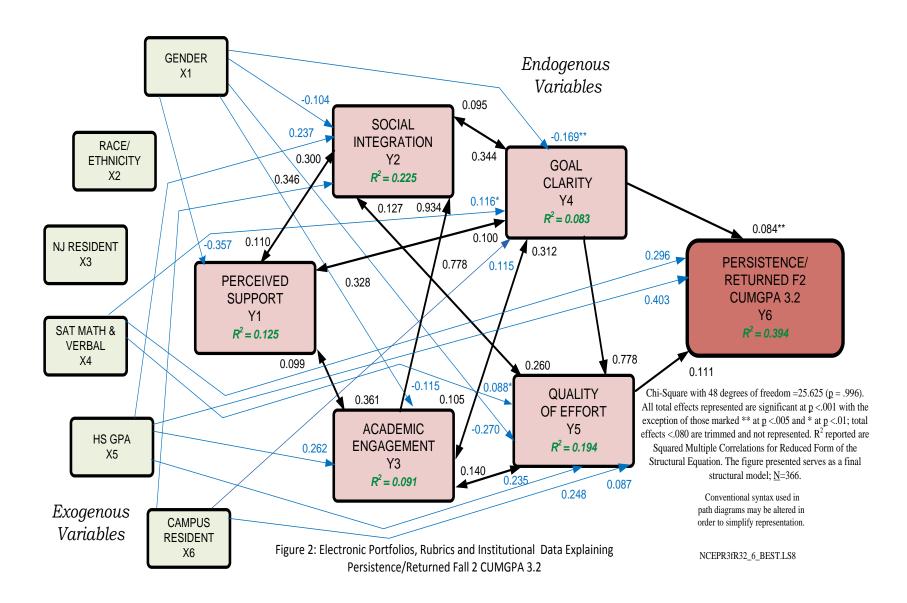
- Knight, W. E., Hakel, M. D., and Gromko, M. (2008). <u>The Relationship between Electronic Portfolio Participation and Student Success</u>, Professional File, Number 107, Spring 2008, Association for Institutional Research (AIR), Tallahassee, FL.
- Kuh, G. D. (2001). The National Survey of Student Engagement: Conceptual Framework and Overview of Psychometric Properties, Bloomington, IN: Indiana University, Center for Postsecondary Research and Planning.
- Kuh, G. D., Kinzie, J., Schuh, J. H., Whitt, E. J. et als. (2005). <u>Student Success in College: Creating Conditions that Matter</u>, San Francisco: Jossey-Bass, A Wiley imprint.
- Landry, S. G. and Stewart, H. (2005). "Mobile Computing at Seton Hall University: Using Technology to Increase Learning Effectiveness," in J.E. Groccia and J.E. Miller (Eds.), On Becoming a Productive University:

 Strategies for Reducing Costs and Increasing Quality in Higher Education, p. 176-185. Bolton, MA: Anker Publishing, Company, Inc.
- Linn, R. (2009). "Considerations for College Admissions Testing," <u>Educational Researcher</u>, Vol 38., No. 9. pp. 677-679.
- Pascarella, E. and Terenzini, P. (1991). <u>How College Affects Students: Findings and Insights from Twenty Years of</u>
 Research. San Francisco: Jossey-Bass.
- Pascarella, E. and Terenzini, P. (2005). <u>How College Affects Students: Volume 2, A Third Decade of Research</u>. San Francisco: Jossey-Bass, A Wiley imprint.
- Phan, H. P. (2009a.). "Exploring Students' Reflective Tinkling Practice, Deep Processing Strategies, Effort, and Achievement Goal orientations," <u>Educational Psychology</u>, Vol. 29, No. 3, May 2009, 297-313.
- Phan, H. P. (2009b). "Relations between Goals, Self-Efficacy, Critical Thinking and Deep Processing Strategies: A Path Analysis," <u>Educational Psychology</u>, Vol. 29, No. 7, December 2009, 777-799.
- Sandler, M. E. (2008) "First Year ePortfolio Assessment Initiative: International/National Coalition for Electronic Portfolio Research Project (I/NCEPR)," Assessment Day, The Teaching Learning and Technology Center, Seton Hall University, South Orange, NJ, July 23, 2008.
- Sandler, M. E. (2000). "Career Decision-Making Self-Efficacy, Perceived Stress, and an Integrated Model of Student Persistence: A Structural Model of Finances, Attitudes, Behavior, and Career Development." Research in Higher Education, Vol. 41, No. 5.
- Sandler, M. E., Easterling, J. M. and Zedeck, M. (2008). "A Review of Freshman Electronic Portfolios Using Persistence Factor Rubrics," Making Connections: ePortfolios, Integrative Learning and Assessment Conference, LaGuardia Community College/CUNY, Queens, NY, April 11, 2008.
- Sandler, M. E., Fisher, P. E. and Zedeck, M. (2008). "Assessment: How Surveys and ePortfolios make a Difference in University Settings," NJEDge.Net Conference 5.0, November 20, 2008.

- Tinto, V. (1993). <u>Leaving College: Rethinking the Causes and Cures of Student Attrition</u>. 2nd Edition. Chicago: University of Chicago Press.
- Wankel, L., Gottlieb, T., and Easterling, J. (2008). "First Year ePortfolios: An Initiative to Involve Freshmen in an Assessment of Their Personal Success." 2008 International Assessment & Retention Conference, NASPA, Scottsdale, AZ, June 14, 2008.
- Wolf-Wendel, L., Ward, K. and Kinzie, J. (2009). "A Tangled Web of Terms: The Overlap and Unique Contribution of Involvement, Engagement, and Integration to Understanding College student Success." <u>Journal of</u> College Student Development, 50, 4, Jul/Aug 2009.
- Yancey, K. B. (2008). "Electronic Portfolios a Decade into the Twenty-first Century: What We Know, What We Need to Know" Peer Review, Winter 2009, Vol. 11, Is. 1; p. 28-32, Washington D.C.
- Yancey, K. B. (2001). <u>Introduction: Digitized Student Portfolios</u>. In Cambridge, B. Kahn, S. Tompkins, & Yancey, K.B. (Eds.) "Electronic Portfolios: Emerging Practices in Student, Faculty and Institutional Learning," p. 15-30, Washington, D.C., American Association for Higher Education (AAHE).

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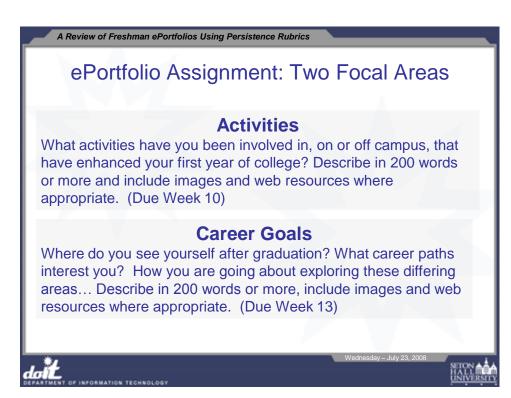


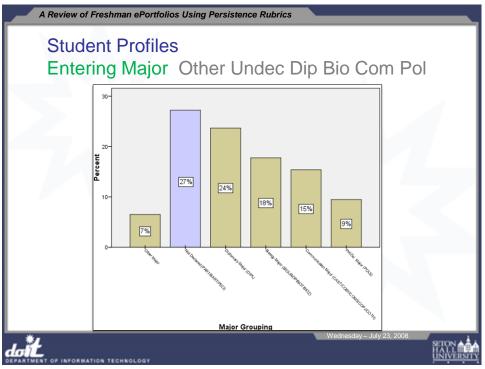


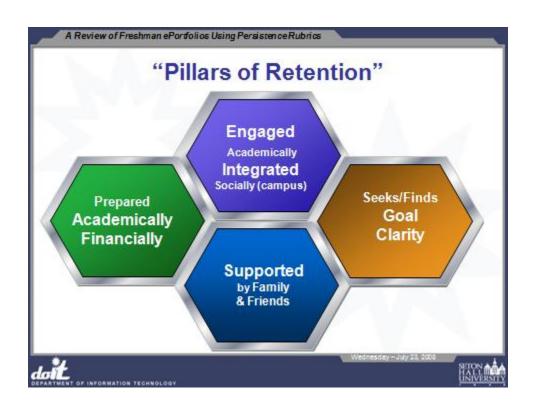
Appendix A

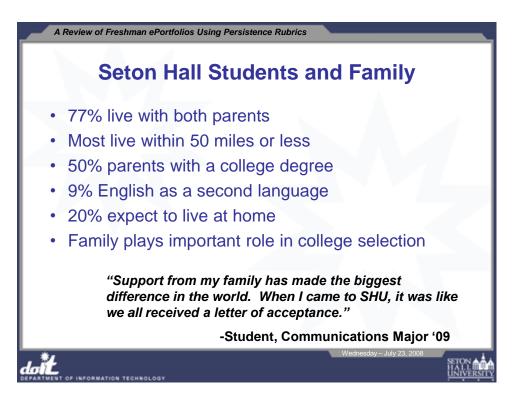


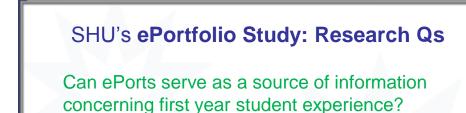












A Review of Freshman ePortfolios Using Persistence Rubrics

What can be learned from a systematic review of freshman ePorts? Will **rubrics** based on **persistence theory** produce meaningful data?

Will ePort data increase our ability to predict student persistence from first to second year?



Wednesday - July 23, 2008



SHU's ePortfolio Study: Project Design

Review 2006 freshman ePorts → create scores

- non-cognitive data: student experiences & thoughts
- examine quality of effort: how well ePort was constructed

Score e-Ports, measure levels of key attributes

known to associate with persistence and

A Review of Freshman ePortfolios Using Persistence Rubrics

• present in the freshman 2006 ePortfolios

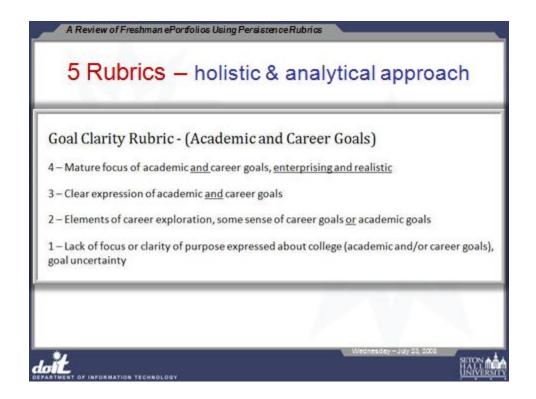
Key Attributes

√goal clarity	√academic engagement
√quality of effort	✓support of family & friends
✓ social integration	

doll
DEPARTMENT OF INFORMATION TECHNOLOGY

Vednesday – July 23, 2008





ration ePortfolio Measure			
Category			
4 – Leadership Role	3 - Much Integration	2 – Some Integration	1 – Scant/No Evid Social Integration
Much Integration (as described for score 3') PLUS either in a leadership role at Seton Hall or expresses interest in a leadership role next term/next year examples: position in FLC, SGA, SAB, SHU team or club	Regular and/or Intensive involvement in 2 or more SHU activities, clubs or groups. • e.g., high frequency • e.g., strong identity potential examples: SHU team, SHU intramural or high involvement SHU club	At least 1 student-selected SHU activity or experience involving regular (at least monthly) participation that is viewed positively by student •e.g., described as pleasing/engaging/of value OR ALTERNATIVELY expresses a clear intent to participate next term/next year	Student shares none or few instances of SHU activities, clubs or group participation levels beyond assigned. AND no statements suggesting intento join an activity, club or group in the near future.
ngagement ePortfolio Measure	ļ		16
Category			
4 - Engagement + Challenge	3 – Much Academic Engagement	2 - Some Academic Engagement	1 – Scant/No Evid Acad Engagement
Much Engagement (as described for score 3') PLUS evidence that at SHU this student is experiencing a good level of (positive) academic challenge	2 or more SHU professors / courses portrayed as a definite positive experience - ie, as enjoyable, engaging or of high quality • e.g., 2 or more courses portrayed this way • e.g., description includes these attributes as an overall for courses, major	At least 1 course or professor described as a definite positive experience for this student e.g., enjoyable, engaging student's interest, or very meaningful or of value to student personally OR statement of being helped or supported academically well by SHU course or	Student includes no descriptions of positive experiences of a course or professor ie, characterized as stimulating interesting or of particular value AND no mention of SHU academic supports as helpful resources