Applying Learning Pattern Theory to Electronic Portfolio Development:
Navigating On-going Programmatic Evaluation

ABSTRACT

This action-research paper focuses on navigating the implementation of a standards-based electronic portfolio (e-folio) system as part of the degree requirements for an educational leadership program. Over a three year period, various instructional approaches were utilized to coach 54 leadership candidates in creating and maintaining e-folios that would document their accomplishments and competencies. E-folio products (n=112) were assessed using a rubric that was standardized by the leadership faculty and linked to national leadership standards. The application of a learning system known as the *Let Me Learn Process*® (1996; 1998) indicated the candidates' learning patterns. Analysis of the data resulted in several instructional and programmatic improvements and a revised faculty action plan.

INTRODUCTION

Introducing aspiring administrators to the national standards in the field is becoming part of the recommended knowledge base in educational leadership programs (Creighton, Harris, & Coleman, 2005). Electronic portfolios (e-folios) can be linked to the national standards in multiple disciplines, including educational administration (Ahn, 2004; Balch, Frampton, & Hirth, 2006; Hauser & Koutouzos, 2005; Strudler & Wetzel, 2005). According to Balch, Frampton and Hirth (2006), portfolio-building can be utilized as both a developmental mechanism and an assessment mechanism in regard to the evolutionary progress of educational leadership candidates. Balch et al. (2006) recommend linking a student's knowledge, disposition and performances to the national

standards of the Interstate School Leaders Licensure Consortium (ISLLC). In so doing, the authors maintain that aspiring administrators will be able to demonstrate that they are aware of national guidelines and standards-based licensing on a building level or district level. Furthermore, they contend that aspiring administrators and current school leaders will be able to demonstrate their increasing awareness of changing national trends in leadership as well as demonstrate that their credentials, knowledge and skills are current in the educational leadership discipline.

Balch et al. (2006) discuss an increasing nationwide trend for school districts to require portfolios for professional development in regard to licensure renewal. They advise that preparing a professional portfolio using technology affords the opportunity to keep students and administrators knowledgeable about current trends and technological changes. They also maintain that graduates and practitioners in the field can benefit from e-folios by continuing to build credentials and find job placements using online communication technologies. As the accreditation process in higher education requires documentation of candidates' achievements of standards-based competencies, portfolios serve as sources of evidence used in justifying an individual student's progress as well as decisions regarding programmatic accreditation (Hauser & Koutouzos, 2005).

As technology continues to be integrated in schools and classrooms, the principal is viewed as the technology leader (Creighton, 2003). Leadership candidates need to develop sufficient comfort with technology in order to assume the responsibility inherent in the position of principal. An assignment to create an e-folio, thereby, offers leadership candidates the opportunity to develop expertise in multiple software environments. Students' technological skills are important factors in the construction of e-folios and the

success of an assessment system (Montgomery & Wiley, 2004). To meet the needs of programs, there are a growing number of software platforms for developing e-folios and vendors that provide user interfaces, such as *College LiveText*. These platforms also provide tools for evaluation and aggregation of assessment results. Selection of a technology platform for e-folio development influences the outcomes and success of the e-folio project in meeting the needs of both candidates and faculty. Therefore, issues of technology, candidate perceptions and faculty assessments are important considerations in developing e-folios that are positive measures of candidates' achievements' and also serve as illustrations of a program's quality.

PURPOSE

This action-research study concentrates on issues resulting from the implementation of a standards-based e-folio system designed to document candidate competencies and program quality over three years in an educational leadership program at a private university in New York. Leadership candidates (n=54) submitted 112 e-folio products that were assessed using a rubric that was standardized by the leadership faculty and linked to national leadership standards. The study illustrates application of learning pattern theory in devising instructional techniques and materials that supported positive outcomes in e-folio products.

PROBLEM

The faculty established the e-folio requirement to meet multiple expectations, including aggregation of data for accreditation purposes, improvement of program quality, alternative assessments to standardized testing, illustration of students' progress throughout the educational leadership program, opportunities for students to engage in varied technology uses and possible job development. As part of the educational leadership curriculum, the faculty introduced educational leadership candidates to the professional standards according to the National Policy

Board for Educational Administration/Educational Leadership Constituent Council [ELCC] (2004), which consolidate the national ISLCC standards. Through multiple instructional approaches, candidates compiled various types of evidence including products from coursework assignments (written or technological) as well as recommendation letters, resumes and honors and included them in their e-folios. Students linked their assignments or artifacts with reflections to each of the seven ELCC standards.

In three years of implementation, the navigation of this technology imperative has involved weathering various approaches. Multiple vendor software platforms and instructional approaches have been tried. Faculty members have documented resistance to the e-folio requirement as well issues of quality surrounding the e-folio products. Leadership candidates' attitudes and experiences with e-folios were key considerations. Assessment and support issues were an on-going concern and were continually addressed with the five documented cohorts of leadership candidates.

When students entered this leadership program, students had varying levels of technology experience in their professional lives. However, the majority of students who entered this leadership program were not familiar with the software environments they needed to use to construct their e-folio products. After the initial course in which the e-folio was introduced and assessed by the instructor (initial assessment), students needed additional support (materials and instruction) in completing the e-folio at succeeding checkpoints (mid-point and capstone) or assessment levels. The evident problems and the slow progress associated with implementing e-folio assessment motivated this action-research study.

THEORETICAL PERSPECTIVE

In order to better understand the phenomena faculty observed when students constructed their e-folios, the faculty began to seek theoretical frameworks that would inform actions. Expectancy theory, which "advocates a connection between the effort of the individual, the possibility of a high level of performance, and the desirability of the reward resulting from a task completed at a highly successful level" (Vroom, l969, as cited in Green, 2005, p.42) was the first theoretical framework applied. Because of its complexity in regard to individual differences, the faculty explored the utility of other theoretical frameworks.

The constructs of the *Let Me Learn Process*® provided an applicable theoretical framework to support the faculty in making program and instructional adjustments for students to achieve satisfactory performance. Johnston's model of learning patterns rests on a theoretical foundation and a research tested instrument, the *Learning Connections Inventory*© (LCI), (Johnston and Dainton (l997a, l997b), that features interactions based on: cognition (thinking), conation (processing) and affectation (feeling) capabilities. These operations interact within each of four diverse learning patterns: S*equence, Precision, Technical Reasoning and Confluent* (for in-depth explanation, see the *Let Me Learn* website: http://www.letmelearn.org).

A learner utilizes the four patterns in different interacting combinations. According to Johnston (l998), *Sequence* seeks to "follow step-by-step directions, organize and plan work carefully, and complete the assignment from beginning to end free from interruptions" (p.24). In *Precision*, the learner "takes detailed notes, asks questions to find out more information, knows exact answers, and reads and writes in a highly specific manner" (p. 25). Through the *Technical Reasoning* pattern, "we see the mechanics of operations, the functions of pieces; we construct, we mull, we make it work, we get it done" (p. 27). *Confluence* "gives us permission to start before all directions are given; take a risk, fail, and start again;

use imaginative ideas and unusual approaches; and improvise" (p. 29). Johnston (1996, 1998) maintains that by informing students of their patterns of learning, they can use that knowledge to address learning tasks with greater intention, thereby achieving positive results in terms of assessments of performance and interaction with other learners.

The choice of Johnston's learning pattern theory rather than expectancy theory as a theoretical framework was based on its adaptability to individual needs and differences. Students were introduced to learning pattern theory and the LCI in the (School) Leadership course, which was sequenced in the first year of a student's entrance into the program. The faculty who taught the course had been cognizant of the learning pattern scores of the leadership students. The faculty recognized that the changing nature of the technological requirements in regard to the construction of e-folios represented new learning situations in which Johnston's learning pattern theory could be applied.

METHODS

This action-research study used both quantitative and qualitative methodology (Bogdan & Biklen, 1998; Mills, 2003) to study the evolving e-folio process in an educational leadership program at a private university in New York. There were 54 aspiring administrators admitted in five cohorts who submitted 112 e-folio products to educational leadership faculty at two primary assessment levels, namely, transitional (mid-point) and final (capstone).

Participants

Participants had educational experience in K-12 schools. There were 10 participants from the first cohort of aspiring educational administrators, nine participants from the second cohort, 21 participants from the third cohort of students, seven

participants from the fourth cohort of students and seven participants from the fifth cohort. Each cohort added an additional iteration to the action-research study.

Among the 54 students, there were 43 females and 11 males participating. A majority of the students were categorized as diverse (n = 29). The largest diverse group represented was composed of Black students (African and Caribbean Americans); there were 20 females and three males in this grouping. In addition, there was one Asian female, two Hispanic females and three Hispanic males; the rest of the students were Caucasian (20 females and five males).

Instrumentation

The learning patterns of the students were assessed by applying the *Learning Connections Inventory*© (LCI) developed by Johnston and Dainton (l997a, l997b). The LCI is a 28-item self report instrument with a Likert scale (1-5) questions and three open-ended questions; scores range from 7 to 35 in each of four categorical areas. The LCI has been nationally and internationally validated and has test-retest reliability (*Learning Connections Resources* Website: http://www.LCRinfo.com) as well as content, construct, and predictive validity (Johnston & Dainton, l997a, l997b). The LCI quantitatively and qualitatively captures the degree to which an individual uses each of the four learning patterns (Pearle & Head, 2002). Learners use patterns first, use them as needed or avoid them. For the purpose of this study, students' LCI patterns were considered in regard to their Use-First or lead learning pattern scores.

The 112 e-folios that supplied the data used in this study primarily consisted of course papers and *PowerPoint* presentations annotated with reflections on the learning process. Students were directed to address all seven ELCC standards as well as a minimum of four of

the School of Education's core values at the final submission of their e-folios. The e-folios were assessed using a standard rubric at three programmatic levels, namely, the beginning of the program (initiation to the e-folio) in the introductory technology course, the transitional level (mid-point of the program) and at the capstone level (before graduation from the program). This study focuses on the cumulative e-folio product at the mid-point and capstone levels of assessment and not the introductory submission of the e-folio in the first technology course, which was limited in content and scope.

Students in the first four cohorts constructed e-folios by creating personal web pages or using *PowerPoint*. Each e-folio product was different based on that student's overall conception of the e-folios. Even though a model template for either a web page or *PowerPoint* slide document was available, students were free to design their own e-folio. Consequently, e-folios were quite vivid and creative.

As part of readying the School of Education for accreditation review, *College LiveText* (http://www.college.*LiveText*.com) was adopted as a standard for portfolio development for all educational preparation programs. *College LiveText* appealed to a majority of the School of Education faculty because of its ability to aggregate assessment results and provide inter-rater reliability information. *College LiveText* was also predicted as a way to reduce time demands through an easy to use template system. Student work could be showcased as students demonstrated their e-folios to their instructors and classmates. The faculty in the leadership program decided to introduce *College LiveText* to their students in the third year of this study. An assessment rubric was redesigned in order to accommodate web page development, *PowerPoint* and *College LiveText*. The spread of points on the rubric extended from 0 to 24 (multiplied by 4). Ratings on the

rubric ranged from distinguished or proficient, to basic or unacceptable (See Appendix A

for Rubric). Qualitative action-research methods used to triangulate the quantitative data

included observations, field notes and selected interviews. As changes were made in the

content or construction of the e-folio requirement, reactions of the students were

documented.

RESULTS

The leadership candidates demonstrated various preferences in their Use-First or lead

learning patterns (See Table 1). A Use-First *Sequential* learning pattern was the primary

pattern attributable to the majority of the candidates. Table 1 outlines the Use-First learning

patterns within each of the five cohorts. It also outlines the total number of e-folios that were

assessed at the mid-point and capstone levels and the number of graduates from the program

over the past three years.

Table 1: Predominant (Use-First) Learning Patterns, E-folios Assessed and Graduates in the Leadership Program

Cohort	#	*Sequential*	*Precise*	*Technical Reasoning*	*Confluent*	Number of E-folios Assessed	Number of Graduates
1st	10	3	1	4	2	20	10
2nd	9	5	2	1	1	18* (1)	8**
3rd	21	12	6	2	1	47* (6)	20**
4th	7	4	2	1	0	14	7
5th	7	3	1	1	2	13	6**
Total	54	27	12	9	6	112	51

*Some students in the second and third cohorts were required to redo their e-folios because of unsatisfactory ratings;
** Some students in the second, third and fifth cohorts decided to take additional time to complete their coursework and so the final assessments of these final e-folios are still pending; 1 student is pending final graduation in each of the 2nd, 3rd and 5th cohorts.

Analysis was conducted to ascertain whether there was a correlation between a

student's Use-First learning pattern score and the score assessed on the e-folio rubric. The

quantitative analysis of the data indicated that there was no correlation between a student's Use-First or lead learning pattern score and the score assessed on the e-folio rubric. When quantitative descriptive statistics were applied to the e-folio products using criteria defined by the assessment rubric, improvements were indicated. Qualitative analysis of the data indicated that several improvements in instructional techniques and materials resulted that occurred primarily in the second and third years of the study. These improvements were found to have a positive impact on candidate perceptions and product outcomes.

In the first year of the study, the first cohort of students was composed of individuals who primarily used *Technical Reasoning* at a Use-First level (LCI *Technical Reasoning* mean score was 30.5). The development of their e-folio products did not reveal major difficulties with implementation, but there were frustrations indicated by the students throughout this initial period.

In the second cohort, (LCI mean *Sequential* Use-First score was 29.6) and the third cohort of students (LCI mean *Sequential* Use-First score of 29.4 and LCI mean *Precise* Use-First score of 27.1), there were seven students that submitted e-folios that were rated "unsatisfactory" by faculty evaluators. Students were coached to resubmit their e-folios in order to receive a positive assessment and advancement into the next level of leadership courses in the program.

Results at the mid-point assessment level from the third cohort (n=21) showed that students became dissatisfied with the outcome of the products, overwhelmed with the e-folio requirement and even "angry" with the additional work required in the development of the e-folio. When instructional changes were implemented that took into

account students' learning patterns, and revised materials were introduced by faculty, there was an improvement in the e-folio products at the final assessment level of the third cohort of students. These instructional changes and improvements consisted of utilizing materials, tools and techniques that would appeal to the Use-First or lead learning patterns of the students. In the final assessment of the e-folio products with the third cohort of students, 19 out of 21 students indicated that they were satisfied with the improvements that had been initiated. E-folio ratings advanced from a mean of 70.04 at the mid-point level (second assessment) to a mean of 88 at the capstone level (final assessment). See Table 2 for a comparison of the mean score of each cohort at the mid-point and final assessment levels. Table 2 also indicates the total number of e-folios assessed.

Table 2: Cohort Participants, PowerPoint or Web Page E-folio Product Assessments

Cohorts	E-folios Assessed at the Transition or 2nd Level	2nd Assessment (Mean Score of Cohort)	E-folios Rated "Unacceptable" & Redone	E-folios Assessed at the Capstone or 3rd Level	Total E-folios Assessed	3rd or Final Assessment (Mean Score of Cohort)
1st	10	77.7		10	20	77.1
2nd	9	75.3	1	8	18	82
3rd	21	70.04	6	20	47	88
4th	7	72.3		7	14	84.5
Total:	47		7	45	99	

At the end of the second year of the study, *College LiveText* was adopted by the faculty of the School of Education as a method of meeting accreditation requirements. The *College LiveText* vendor platform was essentially linear in its design and direction.

In continuing to analyze the learning patterns of their students, the educational leadership faculty reasoned that the *College LiveText* vendor platform might be readily adapted by their students with minimal technological difficulty because students who were entering this leadership program were primarily Use-First *Sequential* learners. *Sequential* learners in the fourth cohort (LCI mean Use-First *Sequential* score of 27.5) and the fifth cohort (LCI mean Use-First *Sequential* score of 30) would be expected to adapt to the linear nature of the *College LiveText* template.

Because of the difficulties encountered with the e-folio assessment that impacted the third cohort of students, the faculty in the leadership program decided to slow down the transfer to *College LiveText*. Therefore, the fourth cohort of students (n=7) in the leadership program continued to construct their e-folios utilizing *PowerPoint*, while the fifth cohort of students (n=7) began *College LiveText* portfolios. Students in the fourth cohort also indicated satisfaction with the development of their e-folios from the second to the third assessment. See Table 2, which illustrates that their E-folio ratings advanced from a mean of 72.3 at the mid-point level (second assessment) to a mean of 84.5 at the capstone level (final assessment).

Given the predominance of Use-First *Sequential* learners represented in this educational leadership program, the faculty felt a transition to a linear template was warranted. Use-First *Sequentia*l learners had indicated that they needed step-by-step directions, a linear or sequential focus and that demands on their time were a prime consideration. Faculty reasoned that even though the Use-First *Confluent* learners in the program might not be as satisfied with the sequential and linear features of the *College*

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LiveText template, these students would be able to apply their creative skills to their actual classroom artifacts and assignments.

Moreover, in order to ease the potential concerns of the fifth cohort of students (n=7), educational leadership faculty announced beforehand that *College LiveText* would be deemed a pilot project, and therefore, the e-folio assessment results for this cohort would not negatively impact progress.

Unfortunately, in the transition to *College LiveText*, a template design flaw became apparent at the mid-point assessment level of the fifth cohort of students. While the faculty intended to assess artifacts and reflections linked to each of the seven ELCC standards, the template prominently featured the six core values of the School of Education rather than the ELCC standards. Therefore, at the mid-point assessment, confused students primarily linked their artifacts to individual core values. When the faculty realized this design flaw, the template was redesigned and the seven ELCC standards were separated into individual sections. Recovery from the design flaw let to satisfactory assessment of the e-folios at the capstone level.

In Table 3, e-folios from the fifth cohort were rated at the mid-point assessment with a mean score of 49.1. After the template was revised, the mean score at the final assessment was 79 (an increase of approximately 30 points). The increase from the mid-point (49.1) to the final assessment score (79) indicated improvement, but it should be noted that there was a small number of students submitting their e-folios during this pilot phase as faculty transitioned from PowerPoint and web pages to *College LiveText.*

Table 3: Cohort Participants, *College LiveText* and E-folio Product Assessments

Cohorts	E-folios Assessed at the Transition or 2nd Level	2nd Assessment (Mean Score of Cohort)	E-folios Rated "Unacceptable" & Redone	E-folios Assessed at the Capstone or 3rd Level	Total E-folios Assessed	3rd or Final Assessment (Mean Score of Cohort)
5th	7	49.1*	0	6	13	79

* Attributed to design flaw in the e-folio leadership template.
Note: One student in this cohort elected to postpone submission.

Nevertheless, the faculty were concerned that the final mean score of the e-folio ratings of the fifth cohort of students at the final assessment level showed a decline when comparing the mean scores at the final assessment levels to the previous three cohorts (82 - second cohort; 88 - third cohort; and 84.5 - fourth cohort).

DISCUSSION

According to Mills (2003), instructors who engage in action-research try to improve their teaching and the learning of their students. In this study, faculty sought to develop an understanding of the e-folio process from the students' perspective so that they could refine the e-folio assessment process. Faculty adapted their instructional techniques and improved their course materials by applying the theoretical constructs of learning pattern theory. In so doing, they were attempting to appeal to all learners in the program.

Instructional Improvements

1. A comprehensive step-by step handbook was printed. This continuously updated and expanded handbook includes examples, common questions and answers in regard to e-folio construction as well as several sources and websites for additional information. *Sequential* and *Precise* learners benefited from availability of a printed guide.

2. Demonstrations and tutoring sessions were conducted by instructors who were technology specialists and by educational leadership faculty who were technologically literate. These support sessions appealed to the *Sequential* and *Precise* learners in the program.

3. All instructors in the program revised syllabi and recommended specific artifacts or assignments in their courses as appropriate examples to include in the e-folio. This improvement appealed especially to the *Precise* and *Technical Reasoning* learners.

4. An updated and improved assessment rubric was introduced. The original rubric used for the first two cohorts contained 11 criteria. The revised rubric follows Popham's (2006) recommended emphasis on academic components over technical components. The updated rubric now balances between technology and academic achievement in six areas, namely: selection of artifacts; annotations and reflections; relationship to the seven ELCC standards; technology; composition and mechanics; and overall impression. *Precise* and *Technical Reasoning* learners were especially satisfied with this change. (See Appendix A for the Rubric utilized in this Educational Leadership program).

5. Illustration, demonstration and showcasing of exemplary e-folios were made available to leadership candidates. Faculty asked students to formally sign permission documents giving their approval to demonstrate their e-folios, post them to the *Blackboard* network, to a faculty website or showcase them in various courses in the program. These exemplars were appreciated by the *Sequential, Precise* and the *Confluent* learners.

6. In the third year, faculty course coordinators and e-folio liaisons were established throughout the School of Education to support students and faculty members in navigating the e-folio process.

In the redesign of instruction and assessment in the transition to the *College LiveText* environment, the application of learning pattern theory continued to aid in this endeavor. The lower mean assessment score of the fifth cohort (79) compared to the third (88) and fourth cohorts (84.5) also indicated a need for revised instructional delivery, e-folio support, expanded materials and demonstrations of *College LiveText*. As a result, reviews, evaluations and reflections of the e-folio requirement will be on-going as faculty member continue to navigate technological changes and initiatives with incoming cohorts of leadership candidates.

Program Improvements

From a faculty perspective, courses and curricula were improved as a result of this action-research study. For example, in the redesign of the first introductory computer course, data indicated that students benefited from faculty presentations about the value of developing e-folios, being guided in navigating *College LiveText* software and from receiving guidance in filling in the educational leadership template. Using the handbook as a guide, faculty clarified the assignments to link to the e-folio. In-class peer demonstrations were also found to be a successful instructional device. The fifth cohort of students especially welcomed feedback from their peers as well as from the instructor. As they progressed in the program, students were free to re-submit their e-folios and get additional feedback or tutoring from subsequent faculty instructors and evaluators.

As part of the data collection, students were questioned about the contents of their e-folios, which revealed that certain products from courses and assignments were not directly applicable to the seven ELCC standards or the School of Education's core values. This realization led faculty to re-assess and re-design their course offerings. Currently, faculty members are in the process of updating the leadership program's course offerings and re-writing its curricula. For example, in the 11-course curricula of the program, there are no distance courses and there is only one technological hybrid course. Two additional hybrid courses are currently being designed, which will feature half of the student meetings in a face-to-face format and half of the student meetings in an on-line format. It is expected that this distance learning format of course delivery will be appealing to students who are already technologically proficient. As faculty design the hybrid courses, they will continue to be cognizant of the learning patterns of the leadership candidates.

CONCLUSIONS

The faculty action-plan (Mills, 2003) based on this action-research study now allows faculty to concentrate on the remaining issues in implementing and assessing e-folio products. Issues that are still under consideration by the faculty include:

1) Continued improvements to course materials responding to students' learning patterns;

2) Continuing improvements in program curricula and courses responding to data regarding developing competencies in educational leadership, and

3) Continuing data collection and aggregation for the purposes of program improvement.

In evaluating the consequences of this action-research project, it has become clear that one area of expansion might be directed at school districts in order to highlight the use of e-folios and their importance to the professional development of educational

leaders. While leadership candidates have been anxious to display their e-folio products

to potential employers, leadership candidates have reported that the administrators

responsible for hiring have not been interested in their e-folio demonstrations. The local

labor market environment and state certification issues may have bearing on this

problem, which needs to be explored in greater depth and further research is necessary.

Nevertheless, as advised by Balch et al. (2006), the faculty and graduates from this

leadership program are confident that preparing professional portfolios on-line will keep

them current in regard to technological changes and trends.

RESEARCH SIGNIFICANCE

Sharing this action research report may provide support to leadership faculty who

seek to develop an e-folio assessment system. It will enable leadership faculty to be

cognizant of the technological setting (its successful navigation as well as the problems to be

weathered). As faculty members navigate their own teaching initiatives, they may also

consider the precepts of learning pattern theory as a differentiated instructional model for

more comprehensive direction and programmatic-mapping.

REFERENCES

Ahn, J. (2004). Electronic portfolios: Blending technology, accountability and
    assessment. *The Journal, 31*(9), 12-14.
Balch, B.V., Frampton, P.M., & Hirth, M.A. (2006). *Preparing a professional portfolio:
    A school administrator's guide.* Boston, MA: Pearson Allyn and Bacon.
Bogdan, R. C., & Biklen, S.K. (l998). *Qualitative research in education.* Needham
    Heights, MA. Allyn & Bacon.
College LiveText Website: http://www.college.livetext.com
Creighton, T. (2003). The principal as technology leader. Thousand Oaks, CA: Corwin.
Creighton, T., Harris, S., & Coleman, J.C. (2005). *Crediting the past, challenging the
    present, creating the future*. Huntsville, Texas*:* National Council of Professors of
    Educational Administration.
Eastin, M., & LaRose, R. (2000). Internet self-efficacy and the psychology of the digital
    divide. *Journal of Computer Mediated Communications, 6*(1). [Online].
    Available: http://www.ascusc.org/jcmc/vol6/issue1/eastin.html.

Green, R.L. (2005). *Practicing the art of leadership: A problem-based approach to implementing the ISLLC Standards*. Upper Saddle River, NJ: Pearson Education.

Hauser, G. M., & Koutouzos, D. W. (2005). *The standards-based digital school leader portfolio.*Lanham, Maryland: Rowman & Littlefield Education.

Johnston, C.A. (l996). *Unlocking the will to learn.* Thousand Oaks, CA: Corwin Press.

Johnston, C.A. (l998). *Let me learn.* Thousand Oaks, CA: Corwin Press, Inc.

Johnston, C. A. & Dainton, G.R. (l997a). *Learning connections inventory*. Pittsgrove, NJ: Learning Connections Resources, LLC.

Johnston, C.A. & Dainton, G. R. (l997b). *Learning combination inventory users' manual.* Pittsgrove, NJ: Learning Connections Resources, LLC.

Learning Connections Resources Website: http://www.LCRinfo.com)

Let Me Learn (LML). Website: http://www.letmelearn.org.

Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis.* Thousand Oaks, CA: Sage Publications, Inc.

Mills, G.E. (2003). *Action research: A guide for the teacher researcher.* 2nd Ed. Upper Saddle River, NJ: Merrill Prentice Hall.

Montgomery, K., & Wiley, D. (2004). *Creating e-portfolios using Power Point.* Thousand Oaks, CA: Sage Publications, Inc.

National Policy Board For Educational Administration / Educational Leadership Constituent Council(ELCC) (2004). *Standards for advanced programs in educational leadership: For principals, superintendents, curriculum directors, and supervisors.* Retrieved August 1, 2004, from http://www.npbea.org/ELCC/ELCCStandards%20_5-02.pdf .

Pearle, K.M., & Head, L.M. (2002). Using your brain to build teams at work: A study of The freshman and sophomore engineering clinics at Rowan university. *American Society for Engineering Education Annual Conference & Exposition.*

Popham, W. J. (2006). *Assessment for educational leaders.* Boston, MA: Pearson Allyn & Bacon.

Strudler, N., & Wetzel, K. (2005). The diffusion of electronic portfolios in teacher education: Issues of initiation and implementation. *Journal of Research on Technology in Education, 37,* (4), 411-433.

Appendix A: Rubric for Educational Leadership Program (EDL) Electronic Portfolio (E-Folio)

CRITERIA	Distinguished 4 points	Proficient 3 points	Basic 2 points	Unacceptable 1-0 points
Selection of Artifacts **Points:**	Rich selection of high quality artifacts and work samples drawn from leadership (EDL) program coursework plus professional work. Creatively provides complete and rounded picture of candidate strengths.	Representative selection of high quality artifacts and work samples drawn from leadership program coursework and professional work. Satisfactory picture of candidate strengths.	Adequate selection of artifacts and work samples drawn from leadership courses, professional work. Partial picture of candidate strengths	Artifacts are of inadequate number or quality. Inadequate picture of candidate strengths.
Annotations & Reflections **Points:**	Annotations, reflections articulate; Reflections illustrate the ability to self-critique.	Annotations consistently & accurately explain artifact.	Inconsistent or brief annotations.	None or an insufficient number of reflections.
Relationship to 7 ELCC Standards **Points:**	Clearly achieves each of the 7 ELCC standards.	Generally achieves each of the 7 standards.	Relates to 7 standards, but Inconsistent.	None or insufficient standards achieved.
Technology **Points:**	Technology & Media use exemplary: Photographs, graphics, sound and/or video create interest; Creativity and original ideas enhance content in an innovative way.	Proficient use of technology. Media uses demonstrate originality.	Some attention to including technology. & media.	Technology use inadequate. Media inadequate.
Composition & Mechanics **Points:**	Attractive visual organization of information. Layout use of white space & composition enhances the readability of text. The text has no errors in grammar, capitalization, punctuation, and spelling.	Appropriate visual organization. The text is attractive in most places. Minor format changes would improve readability. The text has very few errors in grammar, capitalization, punctuation, and spelling requiring minor editing and revision.	Difficult to read; inappropriate organization. Formatting tools under- or over-utilized. The text has (4 –6) errors in grammar, capitalization, punctuation, and spelling requiring major editing and revision.	Very difficult to read. Layout is distracting and obscures the content. The text has many (>6) errors in grammar, capitalization, punctuation, and spelling requiring major editing and revision.
Overall Impression **Points:**	Qualities include interesting, creative, detailed, thoughtful, self-reflective, unique, etc.	All of the distinguished qualities, less compelling.	Inconsistent in quality.	Overall impression low quality.

Total Points: _____   Equates to: _____   Assessment: 1   2   3
Evaluator _____   Date: _____
Student Name: _____ Date: _____