CHAPTER FIVE: DISCUSSION

Overview

The purpose of this study was to address the question of the use of Alverno

College's Diagnostic Digital Portfolio (DDP) by describing and evaluating undergraduate

student and faculty use and perceptions. An Interactive form of program evaluation

(Owen, 1999) was the methodology used in this study, which focused on providing

information on program delivery, documenting improvements/innovations, understanding

more fully how and why a program operates in a given way, and providing suggestions

for improving the program (Owen, 1999, p. 44). The key approaches connected with the

Interactive form that are used in this study are responsive evaluation (takes into account

the perspectives of the stakeholders) and developmental evaluation (working with

providers on a continuous improvement).

The three data gathering methods used in this study (mining of the DDP relational

database, student and faculty surveys, and student and faculty interviews) were designed

to address both of the key approaches in the Interactive form of program evaluation:

responsive and developmental evaluation. Student and faculty use and perceptions of the

DDP were broken down into two main areas: seven sub-questions that concern usage by

students and faculty and four additional sub-questions that focus on identifying

characteristics of key performances. These two sets of sub-questions form the main part

of Chapter Five, which is preceded by a summary overview of the important points. The

summary of results of the research sub-questions is followed first by a comparison of

Alverno's DDP to Love, McKean, and Gathercoal's levels of maturation of digital

portfolios and then by a discussion of the relationship of this study to other research,

including Alverno's initial research. Chapter Five ends with a discussion of conclusions, limitations of this study, and future research possibilities.

Summary of Findings

One of the most significant findings of this study was that undergraduate students and faculty WERE logging onto and using the DDP. An analysis of the DDP relational database logs found students logged on six times (median) and faculty logged on 10 times (median) during the spring, 2005 semester. Student surveys and interviews also indicated that students wanted to use the DDP more often and more consistently throughout their educational experience at Alverno. Faculty survey and interview results suggested that faculty would also like to use the DDP more often with their students. However, faculty had concerns about their level of knowledge of the DDP (training issues), as well as concerns about organization, time, and workload issues.

Students completed an average of two key performances during spring, 2005. Therefore, DDP use is meeting the institutional goal of a minimum of two key performances completed each semester. In survey responses and interviews, students described using the DDP primarily when required by faculty, but seemed to know very little about additional DDP features and would like more training. When faculty were asked what they have the students do on the DDP, they usually described their DDP use within specific courses. Faculty also said they would like to use the DDP more often with students. They expressed the need for more time, more training, and more models of DDP use and integration.

The majority of students and faculty indicated the DDP IS useful. Surveys results found that 68.6% of students rated the DDP as *useful* to *extremely useful*, while 83.3% of

faculty rated the DDP as *useful* to *extremely useful*. One theme of the open ended survey questions was that students wished they were using the DDP more often, and if they used it more often, it would become even more useful. Students also discussed issues with timing of the use of the DDP (everything happening at the end of the semester), with not really understanding the purpose of the DDP, and with not knowing much about the DDP in general.

Students and faculty perceived the DDP as EASY to use. Student survey results found that 74.1% of students perceived the DDP as *easy* to *extremely easy* to use, while 6% thought it was *not easy* to use. Faculty survey results found 64.9% of faculty perceived the DDP as *easy* to *extremely easy* to use, while 9.9% perceive the DDP as *not easy* to use. Open-ended survey responses and interviews indicated that students perceived the DDP would be easier to use if they used it more often.

An interesting result of this study concerned the frequency of use of the DDP. Students perceived that the DDP was not being used enough and should be used more often. When asked about frequency of use on the student survey, 51.4% of students responded the DDP was *not used enough*. Student comments, both from open-ended survey questions and from interviews supported these findings. Students also stated the need for faculty to require more consistent use of the DDP. Even students who expressed negativity toward the system in some of their survey responses referred to the infrequent use of the DDP as one of the reasons why they did not like it.

Faculty survey results indicated that 60.5% of faculty used the DDP *less than often* with their students. Open-ended survey questions and interviews supported these findings.

Summarizing the important results of this study made it clear that the majority of undergraduate students and faculty perceived the DDP as an *easy* to use, *useful* tool that should be used *more often*.

<p style="text-align:center">Summary of Research Sub-question Results</p>

This research study focused on seven sub-questions concerning student and faculty use and perceptions of the DDP, along with four sub-questions on the characteristics of key performances. These sub-questions form the organization for the discussion of the results of this study. In addition, a comparison of the DDP to Love, McKean, and Gathercoal's five levels of maturation for digital portfolios is described here.

<p style="text-align:center">*Sub-question 1: How often do students and faculty log onto the DDP?*</p>

Students and faculty WERE logging onto the DDP. An analysis of the DDP's relational database logs found that the median number of student log-ons for the spring, 2005 semester was six (M = 9.1 SD = 10.2). Institutional data listed a total of 2,006 undergraduate and non-degree students attending Alverno during spring, 2005. An analysis of the DDP relational database found a total of 1,893 (94.4%) undergraduate students logged onto the DDP during spring, 2005. Data from the DDP relational database logs found that the median number of DDP faculty log-ons during the spring, 2005 semester was 10 (M = 22.0 SD = 27.8). Comparing these results to institutional records of the number of faculty (180) indicated that approximately 71.4% of faculty logged onto the DDP during spring, 2005.

Survey results found that 32.4% of students perceived they log onto the DDP once a month, or approximately four times a semester. This is slightly lower than the findings

from the DDP database (median = six). Faculty survey results found 57.6% of faculty

perceived that they logged onto the DDP three times or less per month, or approximately

nine times a semester. Again, these results are slightly lower than the findings from the

DDP relational database (median = 10).

Although, during the interviews students and faculty were not specifically asked

the number of times they logged onto the DDP, one overarching interview theme was the

need to use the DDP more often. The findings of this study indicate that students and

faculty WERE logging onto the DDP and they expressed an interest in using the DDP

more often.

Sub-question 2: What do students and faculty do when they log onto the DDP?

Data from the DDP relational database was analyzed to find the average number

of key performances completed by students and the number of active key performances

and files uploaded by faculty during spring, 2005. Survey questions asked for students'

perceptions of the number of key performances they had completed during the semester,

as well how often they used nine features of the DDP. Faculty surveys contained a

question on the number of key performances faculty used during the semester and how

often they used nine features of the DDP. Both student and faculty interviews contained

a question on what type of experiences they have had with the DDP.

An analysis of data from the DDP relational database found that during spring,

2005 students completed an average of two key performances (M = 2.4, SD = 1.5,

median = 2.0). Student survey results were similar to the database findings with 59.4% of

students responding they had completed two or more key performances during the

semester. However, 18.2% of students responded they had completed *no* key

performances, while 22.4% of students perceived they had completed one key performance. It is interesting to note that survey statistics based on student groups found that beginning students had a median of two completed key performances, while intermediate students had a median of one, and advanced students had a median of zero. This could be due to students' perceptions that they used the DDP more in beginning courses or the general perception that they used the DDP infrequently.

An analysis of the DDP relational database found that faculty uploaded a median of 18.0 files during spring, 2005 (M = 27.2 SD=26.8). During this same period, 347 active key performances were created by 100 different faculty (median of 3.0), which provided a range of possible key performances for students to complete. Faculty survey perceptions on the number of active key performances they had on the DDP were slightly lower than database results, with a median of two.

Student interview data supported the survey results. Both intermediate and advanced students indicated they used the DDP more frequently in their beginning courses. For example, an advanced student said, "When I initially came to Alverno [in the course] IN 130 we did a lot of DDP work. My initial Nursing courses had a lot of DDP work…after that, there really wasn't much to upload, maybe a couple of things."

When interviewed, faculty were asked what kinds of things they have done with the DDP; they usually responded by describing how they used the DDP with their students in specific courses. For example:

> My favorite activity is a key performance, that's a self reflection that I arrange for
> PSY 110 students. I piloted it probably three years ago, and I have used it two or
> three times and it consistently gets better self assessments from my students… the

mid-term is to reflect on the theories that we have been learning…I have them

choose a theory and tell me what they understand about that theory in relationship

to a series of questions I give them … part of their mid-term self reflection is to

basically give themselves an overall evaluation on how they did on this mid-term.

I have students reflect on what they have learned to date at mid-term on theory,

and make three goals in those three domains [cognitive, psycho-social, and bio-

social]. So that helps them pull in this very personal self reflection as part of the

course content, as well as pulling in theory.

Another faculty described a unique use of the DDP:

I have each student write feedback to the person they interviewed, and they put it

on the DDP. Then the student would respond to what she learned from both the

interview and the feedback she got from the interviewer. So the prompt, Peer

Feedback, prompted me to include that, and what it created was an opportunity

for me, for the students, when they give peer feedback in that way, where it means

something and it's popular. I couldn't believe the development.

The second aspect concerning what students and faculty did when they logged

onto the DDP focused on their perception of how often they use certain DDP features.

Survey choices available on how often they used the features were: *Do not know what

this is* (0), *Never* (1), *Occasionally* (2), *Often* (3), *Very Often* (4). Although there were

some differences in features of the DDP listed for students and faculty, there were three

features in common: the Reference area, My Resources area, and the Help Menu. Both

students and faculty agreed on these three features as the LEAST-used features. Table 68

displays these findings. The results of this study indicate that students and faculty did not use these features very often.

Table 68

Comparison of Student and Faculty Survey Results of Least-Often Used Features of the DDP

	Students	Faculty	Choices
1.	Reference Area (M = 1.26)	My Resources (M = 1.27)	0-*Do not know what this is,* 1-*Never*, 2-*Occasionally*, 3-*Often*, 4-*Very Often*
2.	Help Menu (M = 1.26)	Help Menu (M = 1.43)	
3.	My Resources (M = 1.30)	Reference Area (M = 1.49)	

Although these three features are considered important by the DDP design team, it seems apparent that students and faculty do not share this view. While some students and faculty described using the Reference area in the interviews, only one student spoke of using the My Resource area. These results could be due to limited training students received on the DDP or they could be due to perceptions that students and faculty do not use the DDP very often.

Student and faculty perceptions of the MOST used DDP features followed the main user processes of the DDP. For example, the main DDP process for students is to complete key performances by uploading self assessments and reading feedback. The main DDP process for faculty is to complete key performances by uploading feedback and assigning an overall status. Faculty usually read the students self assessment and work (if uploaded) before they post their feedback. Table 69 displays the student and faculty survey results of the most often used features of the DDP.

Table 69

Comparison of Student and Faculty Survey Results of Most-Often Used Features of the DDP.

	Students	Faculty	Choices
1.	Uploading Self Assessment (Mean = 2.21)	Uploading feedback (Mean = 2.62)	0-*Do not know what this is,* 1-*Never,*
2.	Checking Feedback (Mean = 2.02)	Reading Self Assessments (Mean = 2.52)	2-*Occasionally,* 3-*Often,*
3.	Add a key performance to My Work area (Mean = 1.98)	Read Student Work (Mean = 2.22)	4-*Very Often*

When students were asked during the interview to describe what kinds of things they had done on the DDP, they usually described putting assessments or assignments into the DDP. For example, a beginning student said: "When we were IN 125 we were told to go on the DDP to do our assessments."

When faculty were asked what kinds of things they had done with the DDP, they usually responded in terms of the courses in which they used the DDP. For example: "We in the Psych department have come to an agreement that in our upper level courses, we will always have some input into the DDP." and "We have used the DDP for SC 120 and SC 118 courses and no longer do so."

The results of this study found that when students and faculty logged onto the DDP they were completing key performances. It is interesting to note that students and faculty did not making adequate use of additional features of the DDP such as the Reference area, My Resource area, and the Help Menu. This could be due to limited training for both students and faculty on various features of the DDP or due to their perceptions of their limited use of the DDP.

Sub-Question 3: What features of the DDP are perceived by students and faculty as

useful or not useful?

It is interesting to note that the features of the DDP students and faculty

considered to be the least useful features are similar to the least often used features from

the preceding sub-question. Table 70 displays the comparison of student and faculty

perceptions of the least useful features of the DDP. Students perceived the Reference and

My Resource areas as two of the least useful features. The third least useful feature for

students was attaching a key performance to a matrix. Perhaps students perceive that

attaching a key performance to a matrix is not a useful feature due to the lack of training

on why to use this feature and/or how to use it.

Table 70

Comparison of Student and Faculty Survey Results of Least-Useful Features of the DDP

	Students	Faculty	Choices
1.	Reference Area (M = 1.54)	My Resources (M = 1.27)	0-*Do not know what this is,*
2.	My Resources (M = 1.57)	Help Menu (M = 1.46)	1-*Not Useful*
3.	Attaching a Key Performance to a Matrix (M = 1.75)	Reference Area (M = 1.68)	2-*Occasionally Useful* 3-*Often Useful*, 4-*Very Useful*

Only a few students interviewed described using the Reference or My Resource

areas unless prompted by faculty. They seemed somewhat unsure as to how these areas

could be used. For example, when asked if she had used the Reference or My Resource

areas one student said, "No, not yet… I am not really familiar with how to get to some of

the stuff on there."

Faculty perception of the least-useful features were identical to their perception of

the least often used features (My Resources, Help Menu, and the Reference area).

During the interviews faculty spoke of viewing Advanced Outcomes of major programs

and using the criteria sheets from the Reference area, but were not familiar with the My

Resource area. This would imply a need to address the purpose of these two areas and

their usefulness in training sessions.

Student and faculty perceptions of the *most-useful* features of the DDP seemed to

mirror the main processes of the DDP. Both students and faculty listed accessing the

DDP from off-campus in their top three most useful features. Easy access to information

any time, anywhere on the Internet is becoming the norm in technology and the data from

this study supports the importance of this easy access. Table 71 displays the comparison

of student and faculty perceptions of the most useful DDP features.

Table 71

Comparison of Student and Faculty Survey Results of Most-Useful Features of the DDP

	Students	**Faculty**	**Choices**
1.	Accessing Work and Self Assessment (M = 2.68)	Providing feedback to students (M = 2.83)	0-*Do not know what this is,* 1-*Not Useful*
2.	Accessing the DDP from Off-Campus (M = 2.66)	Viewing Student Self Assessments (M = 2.59)	2-*Occasionally Useful* 3-*Often Useful*,
3.	Accessing Feedback (M = 2.66)	Accessing the DDP from Off-Campus (M = 2.37)	4-*Very Useful*

It is interesting to note that the mean scores for the most useful features were

generally between 2.6 and 2.8. This could be connected to both students and faculty

comments on the need to use the DDP more often.

Sub-questions 4: What are student and faculty perceptions of the overall usefulness of the

DDP?

Data from surveys and interviews indicated that students and faculty perceived

the DDP as USEFUL. A total of 68.6% of students surveyed rated the DDP as *useful* to

extremely useful. Faculty survey responses indicated that 83.3% of faculty rated the DDP

as *useful* to *extremely useful*. However, 10.1% of students rated the DDP as *not useful*,

while 4.4% of faculty responded the DDP was *not useful*. Advanced students had a lower perception of usefulness of the DDP with 21.7% responding that the DDP was *not useful*. Perhaps this result is connected to advanced students' perception that they do not use the DDP very much after their beginning courses. Survey results found that 10.1% of intermediate students and 5.9% of beginning students responded that the DDP was *not useful*.

Of note in these findings is the pattern of student responses, both to the open-ended survey question which asked them to explain their rating of DDP usefulness, and in their interview comments. A major theme on both the student surveys and interviews was the infrequent and inconsistent use the DDP. Students described the DDP as useful, but not as useful as it could be because they are not using it much. For example, during the interview, an intermediate student said, "The DDP would be such an awesome tool if it was used more frequently."

Student interview comments did not indicate negativity towards the DDP itself; instead, their negative comments focused on the infrequency of use. For example, an advanced student who responded hesitantly to the question of overall usefulness also said "…if it was encouraged to be used in each and every class I think it would be a great tool." An intermediate student said, "I don't see a major use for me in my art therapy. I don't have a whole lot of things to put in there…I haven't had any reason to [use it], so I don't see it as majorly useful." This student went on to say "I think if I were using it to the extent I could be using it, or should be using it, that I would find the whole thing very useful."

Faculty perception of the overall usefulness of the DDP was higher than students. Over 83.3% of faculty responded the DDP was *useful* to *extremely useful* (20.0% responded *extremely useful*). It is interesting to note that faculty perceived the DDP as useful but, according to student perceptions, the faculty do not seem to use it enough.

Survey data supported the interview findings with a high number of positive open-ended comments concerning the usefulness of the DDP. The majority of negative comments were about the DDP process, not the DDP itself. Faculty responses included time and workload issues, various media on the DDP that they did not think is useful (video and audio files), and/or that the DDP does not "fit" with the way they gave feedback. One clearly negative faculty survey response was:

I think we have spent a lot of money on a technological tool that has marginal value that we now need to justify. I may be wrong. I could easily be convinced that I am incorrect. However, the only value I see to the DDP is that students can look back on previous performances. While I think this is neat, I don't see how that is worth millions of dollars and thousands of hours of investment.

Interview data seemed to be skewed to the DDP being a very useful tool with five out of six student interviewees indicating they wanted to use the DDP more often. Faculty interviewees described how they used the DDP and integrated it into their teaching, the need to learn more about the DDP, and the need to use the DDP more often with their students. One faculty indicated they did not like the DDP and would not use it unless required to. However, this interviewee made note of the fact that they could understand why students would think the DDP is useful to them. One faculty member (classified in the negative toward the DDP group) said:

I'll say it is becoming very useful. It is a pain in the neck, but it will always be an

effort but it's work we have to do. When there's enough stuff in there, and we're

using it in a more effective way that's lined up better with our philosophy, then

it's worthwhile; worth the extra effort.

The results of this study found that students and faculty perceived the DDP as a

useful tool. A notable finding is that students responded they wanted to use the DDP

more often, and the more they use it, the more useful they believed the DDP would

become. Students indicated they would like more consistent use of the DDP in their

courses, especially courses within their major program. Faculty responded they wanted to

use the DDP more often with their students. It would seem that both groups agreed on

the need to use the DDP more often. Due to the processes of the DDP, in order for

students to use it more often, faculty need to have students complete key performances.

The findings of this study also indicated that it is important for the institution to create

models of DDP use that demonstrates integration with faculty teaching and assists faculty

in using the DDP more often.

Sub-question 5: What are student and faculty perceptions of ease of use of the DDP?

Survey results indicate that students and faculty perceived the DDP as EASY to

use. Approximately 74.1% of students surveyed responded the DDP was *easy* to

extremely easy to use, while only 6.0% of students thought the DDP was *not easy* to use.

Approximately 65% of faculty thought the DDP was *easy* to *extremely easy* to use, with

9.9% of faculty responding the DDP was *not easy* to use.

It is interesting to note that ease of use of the DDP varied with the student groups.

For example, advanced students had the highest percent of students who thought the DDP

was *not easy* to use (9.8%). Only 6.0% of beginning students responded that the DDP

was *not easy* to use. However, 33.5% of beginning students responded that the DDP was

less than easy to use. These results could be due to beginning students are just learning

the system and/or the limited training they receive. Entering students are introduced to

the DDP during a one-hour training session on technology use at Alverno College.

Besides an introduction to the DDP, students are introduced to the Academic Computing

Center (computer labs that students use), the Alverno network, and Educator. This

technology training session takes place during a two-day general introduction to Alverno

prior to the start of classes.

Negative comments from the open-ended student survey questions were generic

in nature. For example: "With instructions, I can use the DDP but I'm not good with

computers" and "It seems a bit complicated to go through the whole process of uploading

and entering info that I don't really use."

Faculty survey comments indicated some specific issues with the DDP, such as

issues with archiving and cloning, use of the back button, and forgetting how to use the

DDP. Faculty comments also indicated difficulties in using the DDP with large classes,

as well as the length of time it takes to upload feedback to the DDP at the end of the

semester. One faculty wrote "I never use it [DDP]."

Student and faculty interviews supported the survey results. Five out of eight

students interviewed indicated they had no problems using the DDP. One advanced

student responded "I think it has gotten better." An intermediate student's response

focused on not understanding some of the additional functions of the DDP, "…the only

thing [I don't understand] is the Resources. I wish there had been more focus on it."

Four out of six faculty interviewed described some issues with ease of use of the DDP. Two faculty members referred to the DDP "timing out" too fast or had issues with using the browser's Back button. Faculty also mentioned the need to "refresh" the screen, although they viewed this as an irritation rather than a major issue with the DDP. One faculty said using the DDP was getting a little easier, but also indicated the need to keep making the DDP more intuitive. Another faculty interviewed described having had significant technical issues with the DDP in the past, saying "I am not a fan of the system…I have not done anything else and I don't intend to if I don't have to."

The results of this study indicated that both student and faculty perceive the DDP as *easy* to use. The data provided several suggestions to make the DDP even easier to use. It is interesting to note that students responded that if they used the DDP more, it would be easier to use. Faculty survey responses included similar comments concerning frequency of use. One faculty said, "Because I use it at the end of the semester I always need a learning refresher to get into the groove again."

Sub-question 6: What are student and faculty perceptions concerning the frequency of use of the DDP?

Student perception of the frequency of use of the DDP indicated they believe the DDP should be used more often. Frequency of use was a main theme in all of the open-ended student survey questions as well as in the student interviews. The results of the study indicated faculty perceived they should use the DDP more often with their students. Approximately 51% of students responded that the DDP was *not used enough*, while 7.9% of students responded the DDP was being used *more than enough*. Faculty survey

results found 60.5% of faculty responded they use the DDP *less than often* with their students.

Over 50% of the responses to the student survey open-ended question (please explain your rating) commented on not using the DDP enough. Examples include: "Haven't been asked by teachers to use the DDP – have only used it twice for two semesters" and "It seems that for its purpose we don't use it enough. We should use it more."

Faculty responses to the open-ended survey question (please explain your response) indicated they are learning or trying to use the DDP more often. Faculty responses included: (a) "I am on the curve of adoption toward often;" (b) "I've made a commitment to myself to use it every semester;" and (c) "I am doing a bit more each semester. I have designed a key performance every other semester." One faculty wrote on their use of the DDP: "I used it but stopped. It took too much time. At 2 minutes/student to upload in a class of 30 this is 1 hour."

Student and faculty interviews supported the survey results. All eight students interviewed indicated they wanted to use the DDP more often and more consistently. For example, an intermediate student said, "I wish it would be [used] more because I would like to go in there and see [more things]." An advanced student stated: "It tends to be hit or miss with the faculty comfort with the DDP."

Five out of six faculty interviewed wanted to see the DDP used more often. One faculty, in response to the question of what would assist you in your use of the DDP said, "More stuff up there. In particular, more faculty feedback and student self assessments that are aimed at departmental outcomes for majors and supports." Another faculty, in

response to the question, what would you would like to tell the DDP Design Team, said, "I would encourage as many opportunities as possible for faculty to use the DDP as an opportunity to record overall judgment of student work."

The results of this study indicated that both students and faculty would like to see the DDP used *more often*. Survey and interview comments also pointed out that students and faculty believe the more the DDP is used, the more useful it would become. These findings identified the importance for the institution to provide resources, support, and training that assists faculty in increasing their use of the DDP. The findings also suggest that the institution also needs to continue to develop models that integrate the DDP use into faculty teaching and work load.

Sub-question 7: What suggestions do students and faculty have on: how to improve the usefulness of the DDP, how to assist them in using the DDP more, and what general ideas would suggest improvement of the DDP?

One clear reoccurring student theme, in the survey questions regarding suggestions for the DDP, concerned the frequency of use and the need to use the DDP more often. For example, on a student survey question on how to enhance the usefulness of the DDP, one student said, "having professors use it consistently from class to class." On a survey question concerning suggestions for using the DDP more often, a student said, "having more classes access the DDP." One student, in response to a question on suggestions for improving the DDP, said, "…either get rid of it or use it more often."

Another theme for student responses concerning suggestions for the DDP was the need for training. Students frequently responded that they need to understand the purpose of the DDP. Student suggestions included: "have a class on the DDP" and "A better

workshop on how to use it instead of the 20 minutes when you are a beginning student."
Student survey responses also offered some generic suggestions on how to improve the
DDP including: (a) "use it for every class;" (b) "same sign in code;" (c) "if my teachers
valued it and knew how to use it;" and (d) "have instructors do feedback in a timely
manner."

Student interview suggestions mirrored the student survey suggestions, especially
with respect to using the DDP more often. In response to a question on what would you
like to tell the DDP Design Team, students said, (a) "Well, I don't think this is [for] the
design team, as much as encouraging faculty to make it a requirement;" (b) "Keep
reintroducing the idea…I am a senior and this is the first time in a long time that we are
going to start using the DDP;" and (c) "I talked to a few students in preparation for this
interview and I'm getting the same type of feedback. We'd love to use it, but it never
comes up."

Faculty survey responses to the questions on suggestions for the DDP contained a
pattern of calling for increased and on-going training and development, learning more
about features, and increased departmental training and planning. There were also clear
patterns of time and work load issues in faculty responses. For example: (a) "Keep
showing us how not to make it an add-on job;" (b) "Find less time-consuming ways to
give feedback to large classes;" (c) "More time and training;" and (d) "Integrate it with
other faculty work."

Faculty suggestions for improving the DDP seemed to focus more on DDP
process. Examples of faculty survey suggestions for improvement included: (a) "Bring
part-timers aboard;" (b) "More variety of feedback modes;" (c) "Simple means of

scanning handwritten feedback;" and (d) "Accountability." However, there were some specific faculty suggestions on improving the DDP application including: (a) "Longer time out;" (b) "Be able to use the Back Button;" (c) "Remove the Refresh problem;" and (d) "Be able to see more windows at the same time." Some faculty survey responses pertained to institutional processes. For example, one faculty survey response was, "Use it to address institution-wide issues around quantity, quality, and timeliness of feedback. Use it to help the college rethink and organize narrative transcripts."

Faculty interviews also provided some suggestions for enhancing use and improving process. Examples include: (a) "just keep being the cheerleaders… I think if there has to be a team of dedicated people that keep hammering away on it;" (b) "It would be nice if we could do batch uploads so that I could take my whole class and upload all of the feedback at once;" (c) "I think it would be useful to get a report of something of the student's progress with respect to each of the departmental outcomes;" and (d) "More final evaluative feedback on courses."

Survey and interview suggestions given by students indicated that they want to use the DDP more often and have more training on how to use the DDP, especially with respect to additional DDP features. Faculty comments indicated the need to have more entries in the DDP for students and the need for more training. Faculty training suggestions extended beyond the "how to" of the DDP and included the need for training on the integration of the DDP into teaching and workload. The results of this study identified faculty issues concerning using the DDP with large classes and the time it takes to upload feedback into the DDP.

Summary of Results on Characteristics of Key Performances

This study investigated four main questions concerning the characteristics of key performances: (a) active key performances being used by students, (b) departments that have completed key performances, (c) key performance connection to abilities and levels, and (d) key performance connection to other matrices.

How many active key performances are being used by students?

Data from the DDP relational database found that 38.9% of active key performances were completed by students during the spring, 2005 semester (472 active key performances, 184 were used). These results reveal that 61.1% of active key performances on the DDP were not used during spring, 2005. These results could be due to some courses being offered every other semester, faculty teaching rotations, or lack of training in how to archive the key performance (remove it from the active list). The fact of having unused key performances could create an issue for students who are searching for a particular active key performance to complete and could result in errors in selection of the correct key performance. It is important for the institution to investigate and track the use of active key performances and create maintenance plans that will keep the list of active key performances as up-to-date as possible.

What discipline departments have completed key performances?

A total of 58.7% of departments had completed key performances during spring, 2005. The Assessment Center (AC) had the highest percent of completed key performances at 23.6%, with the Communication Ability Department second at 19.6%. These results indicated that two departments accounted for 43.2% of completed key performances. It is important that additional departments, especially discipline

departments with majors, increase their number of completed key performances. This

suggestion is reinforced by student comments that they seem to use the DDP in their

beginning courses (general education), but use the DDP very little in their major courses.

How are completed key performances connected to the abilities?

Key performances completed during spring, 2005, were connected to all eight

abilities and all four levels (refer to Chapter One for explanation of abilities and levels).

These results indicated that students could use the DDP to demonstrate their progress in

development of the eight abilities and levels. The Communication ability accounted for

43.6% of completed key performances connected to abilities. The Analysis ability was

second with 19.7% of completed key performances connected to this ability, followed by

Problem Solving with 11.8%. The other five abilities (Valuing, Social Interaction,

Effective Citizenship, Global Perspectives, and Aesthetic Engagement) together

accounted for approximately 25% of completed key performance connected to the

Abilities Matrix. While all four levels of abilities were represented by completed key

performance, level three had the highest percentage of connections, with 29.6%. Level

four had the smallest percentage of connections to completed key performances with

16.8%.

The results of this study indicated that students could demonstrate all eight

abilities and four levels in completed key performances on the DDP during spring, 2005.

This is a critical point, because the purpose of the DDP is to assist students in analyzing

their development in the eight abilities. While Communication has the highest

percentage of completed key performance connections to the Ability Matrix, it is

important to note that these connections are usually at the beginning levels (levels 1 and

2). It will be important to continue to expand the demonstration of abilities and levels on

the DDP to insure students have sufficient numbers of key performances to analyze their

development in all of the abilities and levels.

How are completed key performances connected to other matrices?

The results from this study indicated that key performances were connected to

other matrices in the DDP; however, these connections are somewhat limited. For

example, key performances completed during spring, 2005, were connected to 29

different matrices (other than the Ability Matrix). In spring, 2005, there were 59 different

active matrices in the DDP (other than the Ability Matrix). An analysis of this data

indicated that 49.1% of matrices were connected to completed key performances.

The Wisconsin Educational Standard's matrix had the highest percentage of

connections to completed key performances with 17.3%. Psychology was next at 14.8%,

followed by the Wisconsin Mathematical Guidelines with 10.1%. Approximately 69% of

all connections were from seven matrices (Wisconsin Educational Standards,

Psychology, Wisconsin Mathematical Guidelines, English (8.8%), Computer Science

(6.9%), Business and Management (5.9%), and Education (5.0%)).

The results of this study indicated a need to expand the connections of key

performances to a larger variety of matrices. These results supported findings from

student surveys and interviews which indicated that the DDP seems to be used more in

beginning general education courses (connections to ability matrix) than in intermediate

and advanced course work (usually connected to advanced outcomes matrices).

Comparison of the DDP to Love, McKean, and Gathercoal's Levels of Maturation for

Digital Portfolios

Love, McKean, and Gathercoal's research on levels of maturation of digital

portfolios was used to analyze the maturation level of the DDP. This analysis could

provide additional perspectives for looking at the criteria for the various levels of

maturation, especially as they apply to an institution-wide, required digital portfolio

(DDP).

To compare the DDP to Love, McKean, and Gathercoal's five levels of maturation of

digital portfolios, the criteria set forth by the authors were used (statements regarding

system structure and function). Table 72 lists the five levels of maturation, the authors'

statement regarding system structure and function for each level, and a description of

how Alverno's DDP meets these statements.

The authors determined their five levels of maturation by analyzing and

categorizing eight physical and theoretical qualities they believe are inherent in the

portfolio/webfolio processes and applications. These eight qualities include:

1. Type of portfolio/webfolio – working or showcase

2. Organization of the portfolio/webfolio

3. Type of student artifact in the portfolio/webfolio

4. Presence and capture of feedback and assessment based on standards

5. Nature of the portfolio/webfolio content – static or dynamic and evolving

6. Heuristic processes involved in developing the portfolio/webfolio

7. Context provided for each item in the portfolio/webfolio

Table 72

Comparison of the DDP to Love, McKean, and Gathercoal's Levels of Maturation for Digital Portfolios

Maturation Level	Statement Regarding System Structure and Function	Alverno's DDP
Level 1: Scrapbook Hard-copy, e-portfolio, or webfolio	Students have no schema that guides the organization and artifact selection. A portfolio is really just a scrapbook of assignments completed in course or awards received along the way	Alverno's DDP is not just a scrapbook. There is a specific schema (key performances) that guides the organization of the learning artifacts.
Level 2: Curriculum Vitae Hard-copy, e-portfolio, or webfolio	Student work is guided and arranged by educator, department, or institution determined curriculum requirements or standards and institution-wide "student life" contributions.	Student work is arranged by institutional abilities, advanced outcomes of major and support (minor) areas, Wisconsin Educational Standards, and/or Wisconsin Content Guidelines
Level 3: Curriculum Collaboration Webfolio	The student can contribute to the content structure within the departmental and program curricular framework or "student life" institutional showcase of achievements. The portfolio is a working and a showcase portfolio.	Alverno's DDP is both a working and a showcase portfolio. Students can elect to "pull off" selected key performances to form other portfolios. The DDP also includes areas (My Resources) and processes (Independently Learning Experiences) that allow students to make their own entries connected to curricular or extra-curricular activities.
Level 4: Mentoring Leading to Mastery Webfolio	Students can redeem their work multiple times based on feedback from a variety of interested parties, educators, mentors, administrators, parent/caregiver(s), employers, and recruiters.	Alverno's DDP is an integrated system of multiple performances that include assignments, learning resources, student work, and feedback. The DDP has the ability to include a variety of media including audio and video. Students must complete a self assessment for each key performance, providing an emphasis on reflection. There are also selected time in the student's curriculum where they are asked to reflect on their prior learning, assess strengths and challenges, and create learning plans for the future.
Level 5: Authentic Evidence as the Authoritative Evidence Webfolio	Work-sample assessment is linked to standards, program goals, and other descriptors like higher-order thinking taxonomies, and this data is retrieved for analysis at the individual, class, program, or institutional level.	The DDP is an integrated system of assignments, assessments, learning resources, student work and feedback that is linked (connected to) state educational standards for pre-service teachers, institutional standards (eight abilities), program standards (Advanced Outcomes of majors and supports), and includes multiple performances. The DDP does not provide the ability for students to control who can view their portfolio, because all faculty can view all student portfolios. Students do have the ability to control anyone else's access to their portfolio.

8. Delivery mode for the portfolio/webfolio (Love, McKean, and Gathercoal, 2004, p. 25)

In addition to these eight qualities, they also considered six value-oriented issues: value to the student, value to the employer, value to the educator, value to the educational institution, potential for contributing to digital equity within the educational institution, and expense involved in developing the portfolio/webfolio (Love, McKean, and Gathercoal, 2004, p. 26).

Each of the descriptions of the levels of maturation builds on the previous level. For example, Level 5 assumes the student can *redeem their work multiple times* (from Level 4) as well as having *work sample assessment linked to standards*. Table 73 lists each of the eight physical/theoretical qualities and the six value-oriented issues with a summary description for Level 5 (Authentic Evidence as Authoritative Evidence) to provide additional data on the comparison of the DDP to the five levels of maturation. The last column in the table describes characteristics of the DDP that relate to each of these qualities and issues.

Table 73

Comparison of DDP to Level 5 Maturation: Authentic Evidence as the Authoritative Evidence--Webfolio

Qualities Issues	Level 5 Description	Characteristics of DDP
Description	Integrated system of assignments, learning resources, student work, formative and summative feedback linked to national, state, and program standards; multiple opportunities to master curricular content	The DDP is an integrated system of key performances, that are linked to Alverno's eight abilities and four levels, Advanced Outcomes of majors/minors, and/or state educational standards and content guidelines that include feedback
Type	Working or showcase	Developmental portfolio with the ability to create a variety of showcase portfolios

Table Continued

Qualities Issues	Level 5 Description	Characteristics of DDP
Organization	Student work arranged by department and program curriculum initiatives and institution-wide "student life" contributions; also might include student contributions to content structure within department of program curricular framework or "student life" institutional showcase	DDP is organized by matrices (See Description above); also includes learning inventories and can include entries related to co-curricular activities
Student Artifact	Multimedia capabilities	Multimedia capabilities; video portfolio for each student related to student development of speaking
Feedback and Assessment	Formative and summative feedback, provided by teachers, mentors, administrators, parents/caregivers, employers, or recruiters; work-sample assessment linked to national, state, and program standards and retrieved for analysis at individual, class, program, or institutional level	Completed key performances must contain feedback; feedback can be provided by teachers, mentors, external assessors; key performances are organized and linked to matrices; can be retrieved by student, faculty or institution for analysis
Nature of Content	Dynamic content; may be revised based on instructor and/or mentor feedback until the content is "locked" by instructors	Learning artifacts connected to key performances are locked after 24 hours; area of DDP available for students to upload additional resources that may be modified at any time
Heuristic Process	Student-controlled process of reflection and critical thinking mediated by choices made in program, educator, and/or student life; student responses to course and program assignments, or constructed work samples within a particular curriculum; student control over what categories of people (all teachers, students, recruiters, and so on) can view each work sample; students maintain working and showcase portfolios with the same work samples but limit access of the "showcase audience" to the best and most relevant works	Completed key performances must contain student self assessments; students capable of controlling key performance connection certain matrices; ability to upload work samples; students have control over creating a variety of showcase portfolios for different audiences.
Context	Provided by institution, program, educators, and students; includes information about the institution, faculty, program, specific syllabi and assignments, additional help, resources, assessment criteria, and student work sample; may include product description and work samples provided by student	Key performances created by faculty or departments contain context in the form of description and criteria for judgment; student work samples maybe uploaded or required by faculty.
Delivery	Electronic – anywhere, any time	Internet-based anywhere, any time
Student Value	High—enhanced communication involving multimedia messages among student, teacher, mentors, significant others, recruiters employers; great potential for feedback, reflection, and self-appraisal within a heuristic process	Data gathered in this study indicated student value the DDP as a source of reflection and feedback that is developmental; students express need to use the DDP more frequently

Table Continued

Table Continued

Qualities Issues	Level 5 Description	Characteristics of DDP
Employer Value	High—enhanced communication involving multimedia messages among student, teacher, institution, and employers; employer can view student's showcase portfolio, with the benefit of contextual clues from institution, syllabi, assignments, help, resources, and assessment criteria	Students can create a variety of showcase portfolios for employers that include the context of the key performances, criteria for judgments, and feedback on the quality of the work based on the criteria.
Educator Value	High—enhanced communication involving multimedia messages among student, teacher, mentors, significant others, recruiters employers; educator can repeat instructional implementation by copying course content from one semester to the next, each time enriching the content through additional resources and new curricular initiatives; educators also can ascertain which students meet or exceeded standards linked to specific assignments, using assessment data to assist course revision	Faculty can clone key performances to refine and develop; DDP contains reference section with resources on ability descriptions and Advanced Outcomes statements; specific feedback on key performances can detail quality of students performance and are always linked to one or more matrices
Institutional Value	Moderate—enhanced communication involving multimedia messages among student, teacher, mentors, significant others, recruiters, employers; institution can repeat instructional implementation by copying course content from one instructor to the next, each time enriching the content through additional resources and new curricular initiatives, institution also can ascertain which students met or exceeded standards linked to specific assignments, using assessment data to assist program revision.	Because the DDP mirrors Alverno's Ability-based educational philosophy the value to the institution is high; DDP provides "snapshots" of student performances across time and throughout the curriculum; can provide source of data for institutional research.
Digital Equity	Highly likely (if requirement for students)	Required by all undergraduate students
Expense	Low	High implementation expense, moderate expense to maintain depending on programming and enhancements made

The DDP clearly meets the majority of the qualities and issues listed by the authors. In the *Type* quality, the DDP is a developmental (working) portfolio that can also be used to create separate showcase portfolios by download a selection of key performances to their computer or CD. Under *Nature of Content*, learning artifacts that are connected to key performances are "locked" after 24-hours. In the *Context* quality,

the creation of key performances requires context to be added in the form of a description and explicit criteria. In addition, feedback from a faculty member or external assessor is required to complete the key performance. In the *Heuristic Process* quality, the DDP does not provide complete student control over who can view their DDP. Alverno faculty can view a student's DDP, but security measures prohibit anyone else from viewing it. However, as stated earlier Alverno students have the ability to download and create selective portfolios and control who can view these downloaded portfolios.

The results from this study indicate that student and faculty value of the DDP was high. Students valued the ease of access and the ability to check past work and current feedback any time, any place. Faculty viewed the DDP as a tool they would like to use more often; one that is useful to them. One difference between level 5 maturation and the DDP concerned institutional value. Love, McKean, and Gathercoal's list the value to the institution as moderate at level 5. The DDP's value to the institution is high, due to the DDP mirroring Alverno's Ability-Based learning philosophy. The DDP also differs from level 5 maturation in the category of *Expense*. The authors list expense as low at level 5 because "students can assign and reassign access to a variety of constituencies; because students can modify webfolio items, which are instantly undated for all to see; and because there is no delivery cost to the student." (Love, McKean, Gathercoal, 2004, p. 34) It seems, that by expense the authors are referring to expense for the owner (student) rather than the expense to the institution. For example, they list the expense for level 1 Scrapbook and level 2 Curriculum Vitae as high, while levels 3 to 5 expenses are listed at low. While there is no *direct* delivery cost to the student when using the DDP, there is a cost to the institution to maintain and/or enhance the DDP.

Relationships of Results to Previous Research

Most research on digital portfolios focuses on explaining the various types and categories, describing digital portfolio programs, and/or explaining implementation strategies. This study went beyond describing the DDP and provided data on students and faculty *use* of the DDP. There is also limited research data on student and faculty perceptions of digital portfolios. This study expanded the research and demonstrated that Alverno students and faculty perceived DDP as an easy to use, useful tool. The study also pointed out that while faculty perceived the DDP as a useful tool, they did not seem to use it as often as they would like. In addition, this study provided insights into issues that could inhibit faculty use of digital portfolios.

This study reinforced Zou's findings that digital portfolios need to be reflective learning tools. The findings of this study mirrored Zou's results concerning the positive attitudes of the majority of students towards the portfolio process. Although Zou's study focused on teacher education and on institution-wide digital portfolios, this study's results reinforced one of her premises -- learning portfolios seem to trigger student interest and motivation.

This study expanded the initial research on the DDP completed by Alverno's Educational Research and Evaluation Department (ERE), significantly adding to the data on DDP use. The results of this study expanded the quantitative data gathered by ERE on student log-ons (Table 14), as well as providing new data on faculty log-ons. This study has also added to the qualitative data gathered by ERE from the 2002 student interviews. Six questions from the ERE student interviews were incorporated into the student interviews.

In a document on Research and Evaluation Activities 2001-2002, Rickards described student experiences as falling into three categories. Table 74 outlines these three categories, ERE's findings, and a description of related data from this study. The data gathered from this study supported and extended ERE's findings. For example, ERE described the *Introductory* category as being guided by faculty or staff members who work closely with the student and directs procedures, usually occurring at the beginning level. Data from this study indicated that tasks such as logging onto the DDP, exploring sections, preparing/uploading self assessments, and reading feedback are completed by students with limited faculty or staff direction. Students perceived the DDP was relatively easy to use for these basic tasks. However, the results of this study found that students wanted additional training on the variety of other features available on the DDP. One pattern of student responses in this study was the need to use the DDP more frequently and consistently throughout their curriculum. The results of this study indicated that students did not really perceive a difference between the *Introductory* and *Supported Use* categories. Studdents used the DDP *independent* of course time to complete key performances assigned by their instructor. Rather than describing the need for direct faculty or staff guidance, students described the need for additional training and an increase in frequency of use of the DDP.

Table 74

Comparison of ERE's Student Experience Categories

Categories	ERE's 2002 Findings	Results of Study
Introductory	Tasks: logging on, exploring sections, preparing and uploading self assessments, and reading feedback Guidance: guided by faculty or staff member who works closely with students. Occurrence: entry to college and in the first few semesters, can occur at later points if faculty are introducing specialized applications	Students did not readily differentiate introductory use from supported use. They did not mention logging onto the DDP as a specific task, but frequently referred to uploading self assessments, work and reading feedback.
Supported Use	Tasks: Linked to particular activities with a course, directed by faculty, but occurs independent of course time. Guidance: Not guided directly by faculty or staff. Occurrence: Some department uses (English Dept. reading list), but primarily in connection with outside-of-class assessments (AC 301 Mid Program Review and GEC 300).	Students seemed to readily understand the basic procedures of uploading self assessments and work without close guidance and describe the DDP as easy to use. Students described using the DDP in beginning and some advanced course work, but described limited intermediate use, except for outside-of-class assessments (AC 301 and AC 260 Mid Program Portfolio Self Assessment). Students expressed the need to use the DDP more frequently and consistently to build their portfolio as well as to increase their knowledge of the DDP.
Student constructing and creating own use	Tasks: Determined by students, including storage strategies and developed by students own patterns and applications. Guidance: No guidance by faculty or staff, strategies and methods developed by the student. Occurrence: Determined by student	A number of students described creating their own uses for the DDP including reviewing past performances, checking past feedback as they prepare for a new learning activity or assessment. A few students described accessing the Reference area to locate criteria sheets, descriptions of abilities, and/or Advanced Outcomes. Students expressed a need to learn more about the variety of features of the DDP, as well as to use the DDP more frequently and consistently.

Data from ERE's 2002 interviews described several suggestions for improving the

DDP. Most of the responses dealt with simplifying functions, especially uploading,

better support form faculty (including use the DDP more often), and providing

opportunities for revisions (ability to remove and revise documents). Two of these

suggestions were addressed in the design of version 2.0 of the DDP: simplifying

uploading and providing the opportunity to revise/correct documents (for 24 hours). Students continue to describe wanting to use the DDP more often. The results of the study in this dissertation included a number of student and faculty suggestions on enhancing the use of the DDP and improving the DDP program, as well as specific suggestions for student and faculty training and development.

A significant note in this research is that this study provided a different perspective on how to look at digital portfolios. Barrett's research describes "portfolios used for assessment of learning" (purpose of the portfolio prescribed by the institution) and "portfolios that support assessment for learning" (purpose of the portfolio agreed upon with the learner) (Barrett, 2005, p. 18). This concept is mirrored by other authors (Lorenzo and Ittelson (2005) and Wilkerson (2003)), who refer to portfolios, other than showcase portfolios, as "products" that are evaluated based on some type of criteria or rubric. This research study offers a different perspective, the concept of *portfolios as learning*. This perspective focuses on digital portfolios as a tool for students to analyze their own patterns of learning and their learning process; a tool that is integrated into the curriculum, rather than a separate "assignment" to be completed or a "product" that needs to be evaluated. With the inclusion of feedback on portfolio entries, *portfolios as learning* become snapshots of student learning performances throughout their entire curriculum. The *portfolio as learning* can be used by students and faculty to set educational goals, analyze the learning progress. This portfolio and assists in providing specific points for students to reflect on, and evaluate their learning progress.

Conclusions

This study provided empirical evidence that students and faculty WERE using the DDP and perceived the DDP as an EASY to use, USEFUL tool that can meet the goal of providing a developmental record of student learning and self assessment in order to analyze learning progress. Students met the institutional goal of completing two key performances during the spring, 2005 semester. Student and faculty perception of the most useful features of the DDP mirrored the processes they used to complete key performance. Students and faculty did not perceive the additional features of the DDP as useful (My Resources, Reference area, Help Menu, and students attaching a key performance to a matrix). This study highlighted the importance for the institution to work on developing training programs that go beyond the basic use of the DDP and encourage and train students and faculty on how to use the DDP to its full potential.

Key performances completed during spring, 2005, provided opportunities for students to demonstrate their development of the eight abilities and four levels of Alverno's ability-based curriculum. However, active key performances connected to Valuing, Social Interaction, Effective Citizenship, Global Perspectives and Aesthetic Engagement abilities could be increased so as to provide additional opportunities for students to demonstrate these abilities.

With respect to key performance characteristics, a majority of active key performances are not being used. This issue should be explored and addressed to ensure that active key performances are actually being used. In addition, more of Alverno's discipline departments need to create and use key performances. This study also found that key performances connected to Advanced Outcomes in majors should be increased.

In addition, the results of this study suggested increasing the use of the DDP by creating more key performances that are used consistently throughout the curriculum. This would not only increase the use of the DDP but also provide students with a richer picture of their learning progress.

This researcher believes an important outcome of this study is that it provided a different perspective for thinking about digital portfolios. Rather than viewing a digital portfolio as a "product" that needs to be assessed or evaluated, digital portfolios can be viewed from the perspective of *portfolios as learning*. The process of adding student self assessments and faculty feedback to the portfolio, as well as analyzing learning development, becomes the focus of the portfolio, rather than how well the portfolio meets certain criteria or rubrics. This does not demean the need for students to create separate portfolios that can be assessed or evaluated in a variety of different discipline programs (for example teacher education). Using student *portfolios as learning* could provide the basis for creating additional portfolios that then could be used to address the variety of purposes of student portfolios (showcase, learning, assessment, and program evaluation).

<div align="center">Implications for Practice</div>

Results of this study reveal that students wanted to use the DDP more often and faculty believed they should use the DDP more often with their students. Faculty interviews provided several examples of discipline department plans for using the DDP. These examples could be communicated to other departments and departments could be encouraged to create and implement their own plans to insure consistent use of the DDP for all students.

A comprehensive training and development plan for the DDP needs to be created to insure that students and faculty understand the purpose and features of the DDP. A central focus to this training plan should be to ensure that students and faculty understand the basic purpose of the DDP and how they can use it to provide a developmental picture of student learning progress. For students this means the development of a comprehensive training plan that spans the entire curriculum. This plan would go beyond "how to" complete a key performance to provide student training on analyzing their patterns of learning, incorporates using the Reference and My Resource area, and includes rationales for students form their own connections to various DDP matrices.

Faculty training needs to be expanded to provide models of DDP use that integrate teaching and learning. Faculty interviews provided some excellent models of this integration, which could be shared with all faculty. Additional models need to be developed and provided as part of a comprehensive training and development plan.

This study reinforces the need to continue to collect data on the use of the DDP, as well as to continue to explore student and faculty perceptions concerning the DDP. Continuous research also needs to be done to monitor consistent use of the DDP throughout students' educational experience at Alverno College.

Limitations of Study

This study was limited to undergraduate student and faculty use and perceptions of Alverno College's Diagnostic Digital Portfolio. Data from the DDP relational database and student and faculty surveys were gathered during only the spring, 2005, semester. Interview data was gathered during the following semester, fall, 2005. The fact that the data gathered from the DDP relational database and the surveys were from only one

semester could impact the results of the study. Interviews completed during the following semester, originally schedule to distance the participants from their surveys, could also have impacted the results.

Data from the DDP relational database could have included students who were not undergraduate students, due to the absence of data in some student program fields (166 records contained blank program fields). However, due to the number of student records analyzed (1,893 student records) this is a limited problem.

There could be limitations concerning students who participated in the survey. Students could have been absent when the survey was given. The number of advanced students (61) who participated in the survey was smaller compared to beginning (172) and intermediate students (91). There were also limitations concerning faculty who participated in the survey. The faculty survey was completed during the May all-college institute. Typically, only full-time faculty attend the institute and the results of this study reflect the perceptions of full-time faculty. Additional research should be done concerning part-time faculty use and perceptions of the DDP.

Participation in the interviews was self selecting. Students or faculty may have had a bias, either for or against the DDP that influenced their decision to be interviewed. Only two advanced students agreed to be interviewed. These two limitations could skew the data concerning student perceptions.

The results of the study may not be generalizable to other digital portfolio programs. However, despite these limitations, the process used in the program evaluation and the subsequent results may be helpful to other schools. For example, the results of this study could provide a model for program evaluation of other digital portfolio

programs; aspects of the data gathering techniques could be applicable for other digital portfolio programs; and though the study is focused on Alverno's Diagnostic Digital Portfolio, the results of this study added to the body of research on digital portfolios.

Future Research Possibilities

This study underscored the importance of continuing research to track the use of the DDP, including student and faculty log-ons, completed key performances, and characteristics of key performance. In addition, research should include continuing, consistent gathering of data on student and faculty perceptions of the DDP.

The results of this study indicated the need to explore how the DDP can contribute to institutional research on Alverno's educational practices and philosophy. For example, can the DDP be used to document student development of self assessment throughout the curriculum?

This study provides the foundation for additional research on the impacts of the DDP on student learning. Now that the institution has empirical data on student and faculty use and perceptions of the DDP, additional research should be done that focuses on investigating the impacts of the DDP on teaching, learning, and assessment.