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When and why do Naval Postgraduate School Distance Learning students withdraw?

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Monterey, California. Naval Postgraduate School

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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

**WHEN AND WHY DO NAVAL POSTGRADUATE SCHOOL
DISTANCE LEARNING STUDENTS WITHDRAW?**

by

Thomas M. Mastre and Benjamin J. Roberts

March 2018

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Prepared for: Naval Postgraduate School

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14. ABSTRACT It was observed that the 10 year average graduation rate for NPS resident students is approximately 93% and the 10 year average graduation rate for NPS DL students is approximately 80%. The observation of this difference led to the three questions under investigation. First, when do NPS DL students withdraw from their programs, second why do NPS DL students withdraw from their programs, and third, is there a difference in the characteristics of NPS DL students who persist and those who withdraw?					
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The report entitled “When and Why do Naval Postgraduate School Distance Learning Students Withdraw?” was prepared for and funded by the Naval Postgraduate School.

Further distribution of all or part of this report is authorized.

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**When and Why do Naval Postgraduate
School Distance Learning students withdraw?**

**T. Mastre - B. Roberts
3-1-18**

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BLUF:

- The graduation rate for NPS DL students is approximately 15% lower than NPS Resident students.
- Using NPS IRRA data it was found that over 40% of NPS DL students who are going to withdraw do so in the first 2 quarters.
- The study's survey showed:
 - a. No statistically significant differences in individual characteristics such as locus of control, resiliency, self-efficacy, goal orientation, and prior knowledge between students who withdrew and those who graduated. Questions 1, 2, 4, 5, 6, 7, 8, 9, 10, and 11. Pages 7 and 8.
 - b. Students who graduated felt a more positive connection with faculty, course materials, and other students than did students who withdrew. Questions 12, 16, 20, 22, 23, 28, 30, 31, 32, 33, 35, and 38. Pages 11, 12, 13, and 14.
 - c. Compared to students who graduated, students who withdrew more often answered that the program did not align with their needs, was not relevant to their job, did not connect to their personal goals, or live up to their expectations. Questions 3, 17, 34, 35, and 39. Pages 11, and 12.
 - d. When compared to students who graduated, students who withdrew more often answered they had other things going on that got in the way of the course and had either a personal or work related life event. Questions 14, 15, 19, and 44. Pages 11 and 12.
 - e. Connection to faculty and other students', support from family and leadership at work, and the alignment of the students' personal goals and the course material seem to play an important role in the persistence decision for NPS DL students.
- Connecting the cluster analysis results and the timing of the decision to withdraw, we conclude students' weigh their personal goals and objectives, connection to faculty and other students, support from family and work related leadership, and "available" time to quickly make a decision to persist or withdraw.
- Suggested areas further of inquiry:
 - a. Activities to promote connection with faculty and other students.
 - b. An asynchronous course to provide prospective students an overview of the knowledge domain to be studied and how it relates to various professions within the Navy.
 - c. A method of clearly showing the students the level of effort involved in NPS programs.

Three questions under investigation

It was observed that the 10 year average graduation rate for NPS resident students is approximately 93% and the 10 year average graduation rate for NPS DL students is approximately 80%. The observation of this difference led to the three questions under investigation. First, when do NPS DL students withdraw from their programs, second why do NPS DL students withdraw from their programs, and third, is there a difference in the characteristics of NPS DL students who persist and those who withdraw?

Historical Persistence/ Withdrawal Models

Student persistence and withdrawal has been studied over a long period with much of the early study focused on resident first year undergraduate students. For example, William G. Spady's 1970, (1) "Dropouts from higher education: An interdisciplinary review and synthesis," reported a model based on Durkheim's theory of suicide could be used to summarize a large proportion of the then current research. Spady's attention was primarily focused on the interaction between student attributes and the university environment.

In his 1975 study, "Dropout from Higher Education: A Theoretical Synthesis of Recent Research," (2) Vincent Tinto continued and extended the study of resident student persistence and withdrawal by developing a model that attempted to explain the processes of interactions between the institution and the individual student that lead to "dropout" behavior in the residential setting. In his 1982 article, "Limits of Theory and Practice in Student Attrition," (3), Tinto commented that the model was focused on the impact the institution had on student drop out behavior. Tinto recognized that the model developed in 1975 did not account for all factors that could lead to withdrawal and that withdrawal from one institution could be driven by the desire to enroll in another institution.

John P. Bean and Barbra S. Metzner's "A Conceptual Model of Nontraditional Undergraduate Student Attrition" describes an important aspect of their model that extends Tinto's model to include external environmental variables that impinge on part-time and commuter students. As part-time and commuter students have similar characteristics to NPS DL students, the addition of these variables is important to the study of NPS DL student attrition. Bean and Metzner note external environmental variables have a greater effect on nontraditional students than traditional students.

Alberto F. Cabrera, Amaury Nora and Maria B. Castaneda published "College Persistence: Structural Equations Modeling Test of an Integrated Model of Student Retention" in 1993. Cabrera, Nora, and Castaneda examined the Tinto model and the Bean - Metzner model and determined there was considerable overlap between the two models. Additionally, they attempted to document how the two theories could be merged. In the May 2004 Volume 13 – Issue 5 of the Distance Education Online Symposium newsletter (DEOSNEWS), Dr Zane L. Berge and Dr Yi-Ping Huang summarize previous models and propose a different student retention model that is aimed to "assist institutions in planning for interventions to address student dropout and to increase

student retention.” (6) Berge and Huang make a distinction between “Retention, Attrition, and Persistence” in that they view “Retention and Attrition” at the institutional level and “Persistence” at the individual student level. Berge and Hang gather the variables addressed in other models into three primary clusters of variables: “Personal Variables”; “Institutional Variables”; and “Circumstantial Variables.” They further subdivide these primary clusters as follows:

“Personal Variables” are divided into the categories of “Demographic Variables,” “Individual Variables,” and “Prior Educational Experience.” “Institutional Variables” are divided into the categories of “Bureaucratic Variables,” “Academic Variables,” and “Social Variables.” Finally, they divided “Circumstantial Variables” into the categories of “Institutional Interactions,” and “Interactions External to the Institution.”

In regards to the student’s decision to withdraw or persist Berge and Huang note the decision is the result of a cost/benefit analysis made by the student and the decision balances personal circumstances and external influences.

For further study an excellent bibliography can be found at the Center for the Study of College Student Retention located at - <http://cscsr.org/References.html>

NPS Model

The model used for this NPS study is based on the previous models discussed and considers the decision students make to either persist or to withdraw is the result of a cost/benefit analysis that balances three clusters of variables.

- Internal Influences: *The students enter their programs with a set of values, beliefs, attitudes, skills, and abilities that we grouped and labeled “internal influences.”*
- External Influences: *There is a set of influences, outside NPS’ control, external to the students, which impact their withdrawal decision.*
- NPS (institutional) Influences: *NPS controls a set of influences that may impact the student’s decision to withdraw.*

Internal influences are similar to the Zane/Huang grouping of “Personal Variables.” “External Influences” are what Zane/Huang grouped as a subset of “Circumstantial Variables.” “NPS (Institutional) Influences” are also a subset of the Zane/Huang model’s “Circumstantial Variables.”

Original NPS Model

Should I stay or should I go.

Internal Influences

Locus of control – "I am responsible for my own success"
Resiliency – "I recover quickly from difficulties."
Self-efficacy – "I believe in my ability to succeed"
Goal orientation – "I work hard to achieve good results."
Prior knowledge - "I had the educational background the course required"
Learning style – "See or hear" I like to see the material explained ... or ... I like to hear explained in detail
Study skill

External Influences

Family supportive – "My family supported my time to study"
Work supportive – "My work gave release time to take this course"
Work support – "I received encouragement form leadership"
Social isolation – Other students were available, I was available for others
Relevancy of material to current work or future work
Life events
 New child
 Change in marital status
 Health issue
 Transfer/Job change during program
 Financial event
Lack of time to do the course work



NPS Influences

NPS Logistical support
NPS Technology support
NPS Bureaucratic interaction
Mode – Blended, Synchronous, Asynchronous, VTC
Course poorly organized
Poor course design
"The course material did not meet my work related educational needs"
Lack of contact with faculty
Difficulty of the material
Poor instruction
Group cohesion
Course effort – volume of work "too much or too little"
Learning outcomes – clear or unclear or misaligned with needs/wants
Feedback from instructor – too much or too little
Satisfaction with course or faculty

Methodology

There were two target populations involved in this study. The first was all DL students who withdrew from an NPS DL degree or certificate program and second, was all DL students who completed an NPS DL degree or certificate program. NPS Institutional Research, Reporting and Analysis (IRRA) provided data sets for each of the target populations. Those data sets yielded 1434 usable records for withdrawn students with 1086 usable email addresses and 5865 usable records for persisters with 3927 usable email addresses. Both data sets included records for students from 2005 through 2017. Each record contained the following data fields: Employee ID, Last Name, First Name, Enrollment Status ID, Is Remote, Curric Number, Curric Short Name, Departure Date, Is US Military, Military Service Name, Is Civilian, Is International, Is Gone, Is Onboard, Start Acad Year, Start Quarter, Degree Level, Expected Grad Date, Grad Date, Email (DL Home), Is Contractor, Is Primary Curriculum, Dis-Enroll Date, Qtrs Enrolled, and Comments.

Methodology - “When do DL students withdraw?”

The raw institutional data provided by the NPS IRRA was filtered to remove duplicates and then sorted by the number of quarters each student was enrolled. A simple histogram using only students who withdrew was constructed and had as its “y” axis the percentage of students withdrawn and as its “x” axis the quarter withdrawn. Separate charts for degree and certificate students were constructed with the data aggregated at the institutional level.

Methodology – “Why do DL student withdraw?” and “Is there a difference in the characteristics of DL students who persist and those who withdraw?”

These questions were studied by surveying NPS DL students who withdrew and separately surveying NPS DL students who persisted from 2005 through February of 2017. Separately, a series of three recruitment emails soliciting participation were sent to the withdrawn and persisted students. The withdrawn NPS DL students produced 225 usable survey responses, which produce a 6% margin of error at the 95% confidence level. The persisters produced 964 usable survey responses, which produce a 3% margin of error at the 95% confidence level. The surveys as described above were posted using NPS’ LimeSurvey tool. Informed consent was achieved by the first question in the survey, which provided an “opt in/out” opportunity. There was no participation incentive provided to the students.

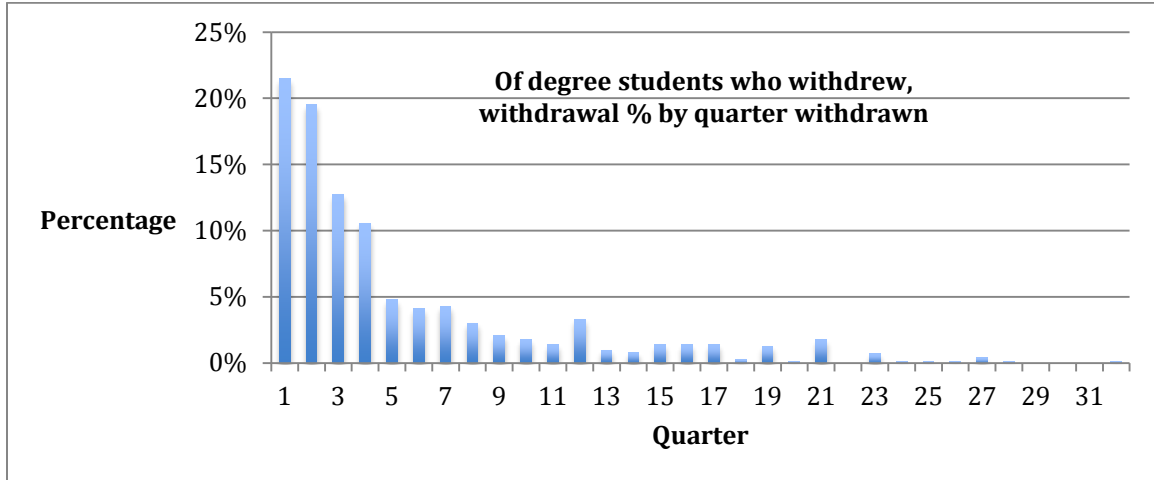
The results of the surveys were analyzed using the Microsoft Excel data analysis tools and SAS JMP statistical tools.

NPS Survey Development

Some questions were derivative of the PRO-SDLS developed by Susan Stockdale, Ph.D. (2010) and the rest were derived from a wide range of previous research then revised and reviewed within NPS. The complete survey can be found in Appendix 1.

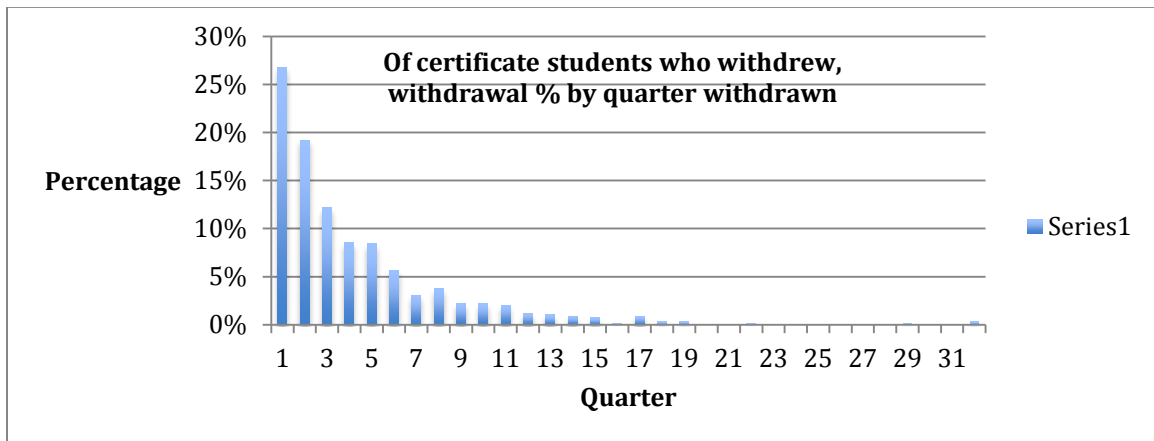
NPS Results

The first question, “When do NPS distance learning students withdraw?”



As seen in the chart above 41% of NPS distance learning Masters degree students who withdrew did so in the first two quarters. The degree chart above also shows an interesting pattern of spikes in withdrawal at approximately four quarter intervals. We believe the spikes are due to thesis extensions expiring but further study is suggested.

Shown in the chart below, 46% of NPS distance learning certificate students who withdrew did so in the first two quarters.



The second and third questions, “Why do NPS distance learning students withdraw?” and “Is there a difference in the characteristics of NPS DL students who persist and those who withdraw?”

Survey Results

For each survey, “withdrawn” and “persisters,” the NPS LimeSurvey tool produced a summary of responses to each question in a table and chart format. Additionally, the “raw” results for each question of each survey were exported into Microsoft Excel spreadsheets and then combined to provide one spreadsheet. An additional spreadsheet was created that paired withdrawn and persisted raw data, question by question. Descriptive statistics were produced for each question and both “t-Test: Two-Sample Assuming Unequal Variances” and “Anova: Single Factor” tests were performed for each question pair.

Statistics for withdrawn and persisted data paired question by question

For two demographic questions, question 40 “Age,” and question 41 “Gender,” there were no statistically significant differences indicated between withdrawals and persisters as determined by “t-Test: Two-Sample Assuming Unequal Variances” and “Anova: Single Factor.” For question 40, the mean age of persisters was 42.5 with a standard deviation of 9.125 and the mean age of a withdrawn student was 43.68 with a standard deviation of 9.55 and for question 41, 20.25% of persisted students reported as female and 18.67% of withdrawn students reported as female. Two demographics “rank” and “program” were not evaluated for this study.

The table below shows 14 of the 51 survey questions with no statistically significant differences between results for withdrawals and persisters as determined by “t-Test: Two-Sample Assuming Unequal Variances” and “Anova: Single Factor.” (1 – Strongly Agree and 5 – Strongly Disagree)

Question	Anova: Single Factor	t-Test: Two-Sample Assuming Unequal Variances P(T<=t) one-tail
Internal Factors 1. I am responsible for my own success	F(1,1186) = 1.158, p = .28	T(304) = -.975, p = .17 Persisted (M= 1.28, SD= .49); Withdrawn (M= 1.32 , SD=.58)
Internal Factors [2. I am confident in my ability to consistently motivate myself.	F(1,1182) =.005, p = .94	T(324) =-.068, p = .47 Persisted (M= 1.55, SD= .68); Withdrawn (M= 1.55 , SD=.71)
Internal Factors [4. I recover quickly from difficulties.]	F(1,1186) = .013, p = .91	T(326) = .113, p = .46 Persisted (M= 1.93, SD= .72); Withdrawn (M= 1.92 , SD=.76)
Internal Factors [5. I prefer to work independently to carry out my plans.]	F(1,1179) = 2.178, p = .14	T(342) = 1.507, p = .066 Persisted (M= 2.31, SD= .88); Withdrawn (M= 2.21 , SD=.85)

Internal Factors [6. I believe in my ability to succeed.]	F(1,1183) = .013, p = .91	T(327) = -.112, p = .46 Persisted (M= 1.41, SD= .57); Withdrawn (M= 1.41 , SD=.59)
Internal Factors [7. I work hard to achieve good results.]	F(1,1184) = .654 , p = .42	T(336) = -.805, p = .21 Persisted (M= 1.34, SD= .53); Withdrawn (M= 1.37 , SD=.54)
Internal Factors [8. I learn best with visual illustrations (e.g., charts, graphs, diagrams)]	F(1,1180) = .414, p = .52	T(336) = .641, p = .26 Persisted (M= 1.98, SD= .80); Withdrawn (M= 1.94 , SD=.80)
Internal Factors [9. I work best with written and spoken explanations.]	F(1,1174) = 0, p = .99	T(340) = .017, p = .49 Persisted (M= 2.48, SD= .85); Withdrawn (M= 2.48 , SD=.83)
Internal Factors [10. Time management is a challenge for me.]	F(1,1175) = .026, p = .871	T(311) = -.153, p = .44 Persisted (M= 3.32, SD= 1.04); Withdrawn (M= 3.33 , SD=1.15)
Internal Factors [11. My academic classroom skills had atrophied.]	F(1,1154) = 3.026, p = .08	T(317) = -1.7, p = .045 Persisted (M= 3.45, SD= 1.10); Withdrawn (M= 3.60 , SD=1.14)
External Factors [18. The time commitment was more than I expected.]	F(1,1169) = 2.505, p = .11	T(289) = 1.44, p = .076 Persisted (M= 3.07 SD= 1.06); Withdrawn (M= 2.93 , SD=1.24)
External Factors (NPS related) [36. Course content was difficult.]	F(1,1156) = .771, p = .38	T(280) = -.847, p = .2 Persisted (M= 3.02, SD= .91); Withdrawn (M= 3.08 , SD=.97)
40. Age	F(1,1173) = 3.085, p = .08	T(320) = -1.707, p = .044 Persisted (M= 42.47, SD= 9.12); Withdrawn (M= 43.68 , SD=9.55)
41. Gender	F(1,1152) = .229, p = .63	T(330) = .486, p = .31 Persisted (M= 1.21, SD= .41); Withdrawn (M= 1.19 , SD=.40)
46) I could attend the course(s) online when and where I wanted (asynchronously). (Yes)	F(1,1186) = 11.18, p<.001	T(337) = -.67, p =.251 Persisted (M= 1.51, SD= .50); Withdrawn (M= 1.54 , SD=.4050)

Exploring the Data

The data for questions with statistically significant differences between NPS DL students who withdrew and NPS DL students who persisted was explored via three different methods. First, the survey results were ordered by the difference between the columns “**Withdraw** - % Strongly Agree – Agree” and “**Persisted** - % Strongly Agree – Agree,” second the questions were sorted in order of largest to smallest “F Statistic,” and last the SAS JMP statistical tool was used to perform “Principle Components Analysis” and “Factor Analysis.”

First, the table shown below contains the % of withdrawn students who agreed or strongly agreed, the % of persisted students who agreed or strongly agreed, and the difference between them. Red font highlights those questions where the “withdrawn” percentage was greater than the “persisted” percentage. Although the withdrawn percentages are sometimes lower than the persisted percentages, it is interesting to note that lower percentages on the part of those who withdrew show trends that may account for their withdrawal. The table was sorted from the largest to smallest difference.

Question	Withdraw % Strongly Agree – Agree	Persisted % Strongly Agree – Agree	% Diff
39) Course objectives aligned with my needs.	52.9	80.5	27.6
12) I felt connected with the faculty and other students in my program.	36.5	63	26.5
19) I had a lot of other things going on that got in the way of this course.	58.2	31.9	26.3
23) I was satisfied with the amount of interaction with other students.	51.6	75.5	23.9
15) I received encouragement from leadership at work.	40.8	61.3	20.5
13) I had much in common with the other students in my program.	37.7	58.2	20.5
17) The coursework was relevant to my job and future career possibilities.	60.9	80.7	19.8
30) Professors presented the material in a clear manner.	64.8	84.6	19.8
22) I was satisfied with the amount of interaction I had with faculty.	56	75.8	19.8
20) In general, I was satisfied with the quality of instruction	71.1	90.8	19.7
31) I was satisfied with my professors.	67.6	86.8	19.2
50) My organization gave me release time to take this program. (yes)	35.1	53.9	18.8
28) Professors were available for consultation.	71.1	89.3	18.2
38) Course objectives were clear.	71.6	89.7	18.1
26) I was satisfied with NPS technology support (e.g., computer related, Sakai learning management system).	64.9	82.7	17.8

21) The Distance Learning format suited my learning style.	56.9	74.6	17.7
14) The people who mean the most to me (family and friends) supported my pursuit of this program.	70.6	87.7	17.1
29) Professors provided me with adequate feedback.	68	84.9	16.9
24) It was easy to get answers to my questions related to my program (e.g., academic rules, course requirements, degree requirements).	68.4	85	16.6
51) My organization gave me a flex-time schedule to take this program. (yes)	32.9	48.4	15.5
32) The course was well organized.	73.8	89	15.2
33) The course materials were well designed.	70.2	84.9	14.7
44) During my NPS Program, I had a life event (such as: New child, Change in marital status, Health issue, Transfer/job change, Financial event).	68.4	54.5	13.9
49) I knew who authorized my attendance and paid for my program. (yes)	72.4	85.7	13.3
47. I took more than one course and experienced both types of formats (synchronous and asynchronous). (Yes)	25.8	39.0	13.2
25) I was satisfied with NPS logistical support (e.g., book shipping, travel, classroom)	70.2	82.5	12.3
45) The course(s) required me to be online or in a VTC at a specific time (synchronously). (Yes)	61.3	72.6	11.3
37) The amount of coursework required too much effort.	17.3	6	11.3
16) I felt isolated from other students in the program.	24.5	13.2	11.3
34) The program did not live up to my expectations.	15.5	5.9	9.6
48) Part of the course was taught with the professor in our facility and partly in a distance-learning environment. (yes)	20	29	9
3) I did not see a connection between this program and my personal goals and interests.	12.9	4.3	8.6
35) Course content did not meet my educational needs.	9.7	3.2	6.5
27) I was satisfied with NPS administrative interaction (e.g., admissions, grades).	72	77.2	5.2

The ordering above highlights specific questions that may provide direction for further study or for actions to increase the graduation rate.

The three tables below show the results of questions with statistically significant differences between NPS DL students who withdrew and NPS DL students who persisted separated into each of the three areas of the NPS model, then ordered by largest to smallest “F” statistic. The tables show the results of the “t-Test: Two-Sample Assuming Unequal Variances,” and the results of the “Anova: Single Factor.” (1 – Strongly Agree and 5 – Strongly Disagree)

<u>Internal Influences</u>	<u>Anova: Single Factor</u>	<u>t-Test: Two-Sample Assuming Unequal Variances</u>
Question number and survey question		P(T<=t) one-tail
3) I did not see a connection between this program and my personal goals and interests.	F(1,1162) = 37.17, p<.001	T(280) = 5.17, p <.001 Persisted (M= 4.33, SD= .88); Withdrawn (M= 3.90, SD=1.16)

<u>External Influences</u>	<u>Anova: Single Factor</u>	<u>t-Test: Two-Sample Assuming Unequal Variances</u>
Question number and survey question		P(T<=t) one-tail
12) I felt connected with the faculty and other students in my program.	F(1,1159) = 68.97, p<.001	T(275) = -7.36, p <.001 Persisted (M= 2.28, SD= .99); Withdrawn (M= 2.94, SD=1.20)
19) I had a lot of other things going on that got in the way of this course.	F(1,1175) = 68.45, p<.001	T(288) = 6.58, p <.001 Persisted (M=2.88, SD= 1.06); Withdrawn (M= 2.26, SD=1.30)
14) The people who mean the most to me (family and friends) supported my pursuit of this program.	F(1,1157) = 49.69, p<.001	T(270) = -5.95, p <.001 Persisted (M= 1.59, SD= .76); Withdrawn (M= 2.02, SD=1.00)
15) I received encouragement from leadership at work.	F(1,1159) = 44.95, p<.001	T(290) = -6.13, p <.001 Persisted (M= 2.28, SD= 1.11); Withdrawn (M= 2.86, SD=1.28)
23) I was satisfied with the amount of interaction with other students.	F(1,1154) = 44.83, p<.001	T(263) = -5.85, p <.001 Persisted (M= 2.09, SD= .87); Withdrawn (M= 2.56, SD=1.08)
17) The coursework was relevant to my job and future career possibilities.	F(1,1176) = 41.45, p<.001	T(275) = -5.61, p <.001 Persisted (M= 1.88, SD= .84); Withdrawn (M= 2.31, SD=1.05)

13) I had much in common with the other students in my program.	F(1,1126) = 27.65, p<.001	T(261) = -4.82, p <.001 Persisted (M= 2.35, SD= .94); Withdrawn (M= 2.74, SD=1.07)
50) My organization gave me release time to take this program. (yes)	F(1,1186) = 26.27, p<.001	T(347) = -5.26, p <.001 Persisted (M= 1.46, SD= .50); Withdrawn (M= 1.65, SD=.48)
49) I knew who authorized my attendance and paid for my program. (yes)	F(1,1186) = 23.19, p<.001	T(291) = -4.14, p <.001 Persisted (M= 1.14, SD= .35); Withdrawn (M= 1.28, SD=.45)
51) My organization gave me a flex-time schedule to take this program. (yes)	F(1,1186) = 17.91, p<.001	T(352) = -4.39, p <.001 Persisted (M= 1.52, SD= .50); Withdrawn (M= 1.67, SD=.47)
16) I felt isolated from other students in the program.	F(1,1153) = 16.77, p<.001	T(283) = 3.79, p <.001 Persisted (M= 3.61, SD= 1.02); Withdrawn (M= 3.28, SD=1.15)
44) During my NPS Program, I had a life event (such as: New child, Change in marital status, Health issue, Transfer/job change, Financial event).	F(1,1186) = 14.60, p<.001	T(354) = 3.98, p <.001 Persisted (M= 1.45, SD= .50); Withdrawn (M= 1.32, SD=.47)

<u>NPS Influences</u>	<u>Anova: Single Factor</u>	<u>t-Test: Two-Sample Assuming Unequal Variances</u>
Question number and survey question		P(T<=t) one-tail
34) The program did not live up to my expectations.	F(1,1156) = 54.51, p<.001	T(259) = 6.27, p <.001 Persisted (M= 4.26, SD= .89); Withdrawn (M= 3.73, SD=1.16)
39) Course objectives aligned with my needs.	F(1,1159) = 46.91, p<.001	T(261) = -5.79, p <.001 Persisted (M= 1.99, SD= .73); Withdrawn (M= 2.4, SD=.95)
35) Course content did not meet my educational needs.	F(1,1149) = 46.36, p<.001	T(246) = 5.50, p <.001 Persisted (M= 4.32, SD= .77); Withdrawn (M= 3.89, SD=1.07)
20) In general, I was satisfied with the quality of instruction	F(1,1168) = 39.56, p<.001	T(257) = -5.11, p <.001 Persisted (M= 1.74, SD= .73); Withdrawn (M= 2.12, SD=1.02)
24) It was easy to get answers to my questions	F(1,1159) = 34.48, p<.001	T(280) = -5.21, p <.001 Persisted (M= 1.80, SD= .80);

related to my program (e.g., academic rules, course requirements, degree requirements).		Withdrawn (M= 2.17, SD=.96)
21) The Distance Learning format suited my learning style.	F(1,1168) = 31.85, p<.001	T(273) = -4.89, p <.001 Persisted (M= 2.03, SD= .92); Withdrawn (M= 2.44, SD=1.15)
28) Professors were available for consultation.	F(1,1153) = 30.27, p<.001	T(266) = -4.76, p <.001 Persisted (M= 1.68, SD= .72); Withdrawn (M= 2.00, SD=.90)
31) I was satisfied with my professors.	F(1,1159) = 28.61, p<.001	T(252) = -4.41, p <.001 Persisted (M= 1.76, SD= .76); Withdrawn (M= 2.09, SD=1.03)
30) Professors presented the material in a clear manner.	F(1,1162) = 27.59, p<.001	T(255) = -4.37, p <.001 Persisted (M= 1.83, SD= .77); Withdrawn (M= 2.16, SD=1.02)
22) I was satisfied with the amount of interaction I had with faculty.	F(1,1163) = 26.65, p<.001	T(266) = -4.47, p <.001 Persisted (M= 2.05, SD= .88); Withdrawn (M= 2.42, SD=1.11)
29) Professors provided me with adequate feedback.	F(1,1156) = 23.61, p<.001	T(260) = -4.21, p <.001 Persisted (M= 1.79, SD= .79); Withdrawn (M= 2.10, SD=.98)
26) I was satisfied with NPS technology support (e.g., computer related, Sakai learning management system).	F(1,1149) = 22.20, p<.001	T(267) = -4.23, p <.001 Persisted (M= 1.85, SD= .84); Withdrawn (M= 2.17, SD=.40)
37) The amount of coursework required <u>too much effort.</u>	F(1,1154) = 21.15, p<.001	T(254) = 3.86, p <.001 Persisted (M= 1.21, SD= .41); Withdrawn (M= 1.19 , SD=1.00)
25) I was satisfied with NPS logistical support (e.g., book shipping, travel, classroom	F(1,1108) = 20.81, p<.001	T(257) = -4.01, p <.001 Persisted (M= 1.77, SD= .82); Withdrawn (M= 2.08, SD=1.01)
38) Course objectives were clear.	F(1,1158) = 19.39, p<.001	T(252) = -3.62, p <.001 Persisted (M= 1.85, SD= .65); Withdrawn (M= 2.09, SD=.89)
27) I was satisfied with NPS administrative interaction (e.g., admissions, grades).	F(1,1146) = 18.57, p<.001	T(274) = -3.90, p <.001 Persisted (M= 1.75, SD= .73); Withdrawn (M= 2.00 , SD=.86)

33) The course materials were well designed.	F(1,1163) = 18.23, p<.001	T(254) = -3.53, p <.001 Persisted (M= 1.84, SD= .74); Withdrawn (M= 2.10, SD=1.00)
32) The course was well organized.	F(1,1159) = 15.34, p<.001	T(255) = -3.30, p <.001 Persisted (M= 1.77, SD= .72); Withdrawn (M= 2.00, SD=.94)
47) I took more than one course and experienced both types of formats (synchronous and asynchronous).	F(1,1186) = 13.99, p<.001	T(365) = -4.00, p <.001 Persisted (M= 1.61, SD= .49); Withdrawn (M= 1.74, SD=.44)
48) Part of the course was taught with the professor in our facility and partly in a distance-learning environment. (yes)	F(1,1186) = 7.60, p=.006	T(371) = -2.98, p =.0015 Persisted (M= 1.71, SD= .45); Withdrawn (M= 1.80 , SD=.40)

For each question showing a statically significant difference between NPS DL students who withdrew and NPS DL students who persisted cells were created that contained the % of withdrawn students who agreed or strongly agreed, the % of persisted students who agreed or strongly agreed, the F-statistic, and the t-statistic. The table was sorted from the largest to smallest F-statistic and the result is shown below.

Question	Withdraw % Strongly Agree – Agree	Persisted % Strongly Agree – Agree	F Stat	T stat
12) I felt connected with the faculty and other students in my program.	36.5	63	68.966	7.36
19) I had a lot of other things going on that got in the way of this course.	58.2	31.9	55.801	6.575
34) The program did not live up to my expectations.	15.5	5.9	54.508	6.266
14) The people who mean the most to me (family and friends) supported my pursuit of this program.	70.6	87.7	49.692	5.947
39) Course objectives aligned with my needs.	52.9	80.5	46.906	5.794
35) Course content did not meet my educational needs.	9.7	3.2	46.364	5.501
15) I received encouragement from leadership at work.	40.8	61.3	44.953	6.133
23) I was satisfied with the amount of interaction with other students.	51.6	75.5	44.826	5.847
17) The coursework was relevant to my job and future career possibilities.	60.9	80.7	41.451	5.607
3) I did not see a connection between this program and my personal goals and interests.	12.9	4.3	37.166	5.17
20) In general, I was satisfied with the quality of instruction	71.1	90.8	35.559	5.108
24) It was easy to get answers to my questions related to my program (e.g., academic rules, course requirements, degree requirements).	68.4	85	34.477	5.206
21) The Distance Learning format suited my learning style.	56.9	74.6	31.85	4.887
28) Professors were available for consultation.	71.1	89.3	30.271	4.762
31) I was satisfied with my professors.	67.6	86.8	28.612	4.406
13) I had much in common with the other students in my program.	37.7	58.2	27.652	4.816
30) Professors presented the material in a clear manner.	64.8	84.6	27.594	4.374
22) I was satisfied with the amount of interaction I had with faculty.	56	75.8	26.652	4.472
50) My organization gave me release time to take this program. (yes)	35.1	53.9	26.265	5.259
29) Professors provided me with adequate feedback.	68	84.9	23.607	4.214
49) I knew who authorized my attendance and paid for my program. (yes)	72.4	85.7	23.192	4.143
26) I was satisfied with NPS technology support (e.g., computer related, Sakai learning management system).	64.9	82.7	22.203	4.23
37) The amount of coursework required too much effort.	17.3	6	21.154	3.856

25) I was satisfied with NPS logistical support (e.g., book shipping, travel, classroom)	70.2	82.5	20.805	4.01
38) Course objectives were clear.	71.6	89.7	19.358	3.618
27) I was satisfied with NPS administrative interaction (e.g., admissions, grades).	72	77.2	18.572	3.9
33) The course materials were well designed.	70.2	84.9	18.232	3.525
51) My organization gave me a flex-time schedule to take this program. (yes)	32.9	48.4	17.914	4.39
16) I felt isolated from other students in the program.	24.5	13.2	16.769	3.794
32) The course was well organized.	73.8	89	15.339	3.301
44) During my NPS Program, I had a life event (such as: New child, Change in marital status, Health issue, Transfer/job change, Financial event).	68.4	54.5	14.6	3.984
45) The course(s) required me to be online or in a VTC at a specific time (synchronously). (Yes)	61.3	72.6	11.179	3.163
47. I took more than one course and experienced both types of formats (synchronous and asynchronous). (Yes)	25.8	39.0	13.99	-4.00
48) Part of the course was taught with the professor in our facility and partly in a distance-learning environment. (yes)	20	29	7.595	2.978

The resultant ordering is slightly different from the table ordered by difference in % of withdrawn students who agreed or strongly agreed, the % of persisted students who agreed or strongly agreed. This ordering highlights the same questions for future study or for actions to increase the graduation rate.

The third method used the SAS JMP statistical tool to perform Cluster Variable analyze on the combined “withdrawn,” and “persisted” data set. Again only questions showing a statistically significant difference between students who persisted and students who withdrew were included in this analysis. Using this method the following 7 clusters were produced. Each “cluster” was sorted from the largest to smallest F-statistic and the result is shown below.

<u>Question</u>	<u>% DIFF</u> <u>Persisted –</u> <u>Withdrawn</u> % Strongly Agree – Agree	<u>F Stat</u>	<u>T stat</u>	<u>Cluster</u>
Connection – Encouragement - Support				
12) I felt connected with the faculty and other students in my program.	26.5	68.966	7.36	1
14) The people who mean the most to me (family and friends) supported my pursuit of this program.	17.1	49.692	5.947	1
15) I received encouragement from leadership at work.	20.5	44.953	6.133	1
23) I was satisfied with the amount of interaction with other students.	23.9	44.826	5.847	1
13) I had much in common with the other students in my program.	20.5	27.652	4.816	1

16) I felt isolated from other students in the program.	-11.3	16.769	3.794	1
Goals – Objectives – Expectations				
34) The program did not live up to my expectations.	-9.6	54.508	6.266	2
39) Course objectives aligned with my needs.	27.6	46.906	5.794	2
35) Course content did not meet my educational needs.	-6.5	46.364	5.501	2
17) The coursework was relevant to my job and future career possibilities.	19.8	41.451	5.607	2
3) I did not see a connection between this program and my personal goals and interests.	-8.6	37.166	5.17	2
38) Course objectives were clear.	18.1	19.358	3.618	2
Faculty - Quality				
20) In general, I was satisfied with the quality of instruction	19.7	35.559	5.108	3
28) Professors were available for consultation.	18.2	30.271	4.762	3
31) I was satisfied with my professors.	19.2	28.612	4.406	3
30) Professors presented the material in a clear manner.	19.8	27.594	4.374	3
22) I was satisfied with the amount of interaction I had with faculty.	19.8	26.652	4.472	3
29) Professors provided me with adequate feedback.	16.9	23.607	4.214	3
33) The course materials were well designed.	14.7	18.232	3.525	3
32) The course was well organized.	15.2	15.339	3.301	3
Logistics – Technology				
24) It was easy to get answers to my questions related to my program (e.g., academic rules, course requirements, degree requirements).	16.6	34.477	5.206	4
21) The Distance Learning format suited my learning style.	17.7	31.85	4.887	4
26) I was satisfied with NPS technology support (e.g., computer related, Sakai learning management system).	17.8	22.203	4.23	4
25) I was satisfied with NPS logistical support (e.g., book shipping, travel, classroom)	12.3	20.805	4.01	4
27) I was satisfied with NPS administrative interaction (e.g., admissions, grades).	5.2	18.572	3.9	4
Time - Effort – Life events				
19) I had a lot of other things going on that got in the way of this course.	-26.3	55.801	6.575	5

37) The amount of coursework required too much effort.	-11.3	21.154	3.856	5
44) During my NPS Program, I had a life event (such as: New child, Change in marital status, Health issue, Transfer/job change, Financial event).	-13.9	14.6	3.984	5
Work leadership commitment				
50) My organization gave me release time to take this program. (yes)	18.8	26.265	5.259	6
49) I knew who authorized my attendance and paid for my program. (yes)	13.3	23.192	4.143	6
51) My organization gave me a flex-time schedule to take this program. (yes)	15.5	17.914	4.39	6
45) The course(s) required me to be online or in a VTC at a specific time (synchronously). (Yes)	11.3	11.179	3.163	6
Course Format				
47. I took more than one course and experienced both types of formats (synchronous and asynchronous).	2.5	13.99	-4.00	7
48) Part of the course was taught with the professor in our facility and partly in a distance-learning environment. (yes)	9	7.595	2.978	7

Based on the cluster analysis performed, a new NPS Model has been created, and is illustrated below.

Final NPS Model

Should I stay or should I go... where are the significant differences

Cluster Analysis Results - Only External and NPS Influences Prevail

Connection – Encouragement - Support

- 12) I felt connected with the faculty and other students in my program.
- 14) The people who mean the most to me (family and friends) supported my pursuit of this program.
- 15) I received encouragement from leadership at work.
- 23) I was satisfied with the amount of interaction with other students.
- 31) I had much in common with the other students in my program.
- 16) I felt isolated from other students in the program.

Goals – Objectives – Expectations

- 34) The program did not live up to my expectations.
- 39) Course objectives aligned with my needs.
- 35) Course content did not meet my educational needs.
- 17) The coursework was relevant to my job and future career possibilities.
- 3) I did not see a connection between this program and my personal goals and interests.
- 38) Course objectives were clear.

Faculty - Quality

- 20) In general, I was satisfied with the quality of instruction
- 28) Professors were available for consultation.
- 31) I was satisfied with my professors.
- 30) Professors presented the material in a clear manner.
- 22) I was satisfied with the amount of interaction I had with faculty.
- 29) Professors provided me with adequate feedback.
- 33) The course materials were well designed.
- 32) The course was well organized.

Logistics – Technology

- 24) It was easy to get answers to my questions related to my program (e.g., academic rules, course requirements, degree requirements).
- 21) The Distance Learning format suited my learning style.
- 26) I was satisfied with NPS technology support (e.g., computer related, Sakai learning management system).
- 25) I was satisfied with NPS logistical support (e.g., book shipping, travel, classroom)
- 27) I was satisfied with NPS administrative interaction (e.g., admissions, grades).

Time - Effort – Life events

- 19) I had a lot of other things going on that got in the way of this course.
- 37) The amount of coursework required too much effort.
- 44) During my NPS Program, I had a life event (such as: New child, Change in marital status, Health issue, Transfer/job change, Financial event).

Work leadership commitment

- 50) My organization gave me release time to take this program. (yes)
- 49) I knew who authorized my attendance and paid for my program. (yes)
- 51) My organization gave me a flex-time schedule to take this program. (yes)
- 45) The course(s) required me to be online or in a VTC at a specific time (synchronously).

Course Format

- 47. I took more than one course and experienced both types of formats (synchronous and asynchronous).
- 48) Part of the course was taught with the professor in our facility and partly in a distance-learning environment. (yes)



Conclusions

The question of when the students withdraw from their NPS DL programs was answered by an analysis of existing NPS student data that showed at the “institutional” level over 40% of students who eventually withdraw do so by the end of the second quarter of their programs.

14 of the 51 survey questions, primarily related to “internal influences,” showed no statistically significant difference. The differences between the NPS DL students who persisted and those who withdrew fall into two areas of the original NPS model, “External Influences,” and “NPS (Institutional) Influences.”

The first three clusters generated by the cluster analysis related to connection to faculty and other students; support from family and leadership at work; and the alignment of the students’ personal goals and the course material. The fifth and sixth clusters related to the amount of time the students’ felt they had to devote to the course.

Connecting the cluster analysis results and the timing of the withdrawal we could conclude that the students’ weigh their personal goals and objectives, connection to faculty and other students, support from family and work related leadership, and “free” time to quickly make a decision to persist or withdraw.

Suggested areas further of inquiry:

Findings from this research lead to three areas of further inquiry that could be fruitful in increasing the persistence or NPS distance learning students.

- 1) A study of learning activities to increase the connection of students and faculty is indicated by the results of this study.
- 2) This study indicates a misalignment of student expectations with course materials. To help distance learning students match their goals and expectations with NPS programs, the development of an asynchronous course that provides prospective students an overview of the knowledge domain to be studied, and how it relates to various professions within the Navy could provide an interesting direction for further research.
- 3) Withdrawn students indicate a lack of time to devote to the NPS program. A method of clearly showing the students the level of effort involved in NPS programs, such as a rigorous orientation, coupled with a more rigorous application process could be an interesting line of inquiry. Additionally, building a strong learning community at the onset on one’s program, along with onboarding efforts that would span the lifecycle of a program, could assist with the misalignment cited above as well as the supportive fit between social and academic milieus.

APPENDIX 1

The NPS survey was constructed to explore the three areas of interest in the NPS model. 15 of the questions involved "Internal Influences." 11 of these were based on a 5 point Likert-type scale and 4 requested demographic information. There were 12 questions focused on "External Influences" with 8 questions based on a 5 point Likert-type scale and 4 "yes/no" questions. 24 questions focused on "NPS Influences." 4 were "yes/no" questions and 20 were used a 5 point Likert-type scale.

Survey Questions

Below is the list questions used in the NPS survey grouped into the three major areas of interest.

Internal Influences

The students enter their programs with a set of values, beliefs, attitudes, skills, and abilities that we grouped and labeled "internal influences." Although there are many internal influences, for this study we chose to investigate the internal influences listed below. A five point Likert-type scale was used for 11 of these questions with 1 – Strongly Agree and 5 – Strongly Disagree. There were 4 questions requesting demographic information.

I am responsible for my own success. 1 – Strongly Agree and 5 – Strongly Disagree

I am confident in my ability to consistently motivate myself. 1 – Strongly Agree and 5 – Strongly Disagree

I did not see a connection between this program and my personal goals and interests. 1 – Strongly Agree and 5 – Strongly Disagree

I recover quickly from difficulties. 1 – Strongly Agree and 5 – Strongly Disagree

I prefer to work independently to carry out my plans. 1 – Strongly Agree and 5 – Strongly Disagree

I believe in my ability to succeed. 1 – Strongly Agree and 5 – Strongly Disagree

I work hard to achieve good results. 1 – Strongly Agree and 5 – Strongly Disagree

I learn best with visual illustrations (e.g., charts, graphs, diagrams). 1 – Strongly Agree and 5 – Strongly Disagree

I work best with written and spoken explanations. 1 – Strongly Agree and 5 – Strongly Disagree

Time management is a challenge for me . 1 – Strongly Agree and 5 – Strongly Disagree

My academic classroom skills had atrophied. 1 – Strongly Agree and 5 – Strongly Disagree

Age

Gender

Program

Rank

External Influences

There is a set of influences, outside NPS' control, external to the students that impact their withdrawal decision. We investigated those influences as listed below. A five point Likert-type scale was used for 8 of these questions, with 1 – Strongly Agree and 5 – Strongly Disagree, and 4 were “yes/no” questions.

I felt connected with the faculty and other students in my program. 1 – Strongly Agree and 5 – Strongly Disagree

I had much in common with the other students in my program. 1 – Strongly Agree and 5 – Strongly Disagree

The people who mean the most to me (family and friends) supported my pursuit of this program. 1 – Strongly Agree and 5 – Strongly Disagree

I received encouragement from leadership at work. 1 – Strongly Agree and 5 – Strongly Disagree

I felt isolated from other students in the program. 1 – Strongly Agree and 5 – Strongly Disagree

The coursework was relevant to my job and future career possibilities. 1 – Strongly Agree and 5 – Strongly Disagree

The time commitment was more than I expected. 1 – Strongly Agree and 5 – Strongly Disagree

I had a lot of other things going on that got in the way of this course. 1 – Strongly Agree and 5 – Strongly Disagree

I knew who authorized my attendance and paid for my program. Yes/No

My organization gave me release time to take this program. Yes/No

My organization gave me a flex-time schedule to take this program. Yes/No

During my NPS Program, I had a life event (such as: New child, Change in marital status, Health issue, Transfer/job change, Financial event). Yes/No

NPS Influences

NPS controls a set of influences that may impact the student's decision to withdraw. We investigated the NPS influences listed below. A five point Likert-type scale was used for 20 of these questions with 1 – Strongly Agree and 5 – Strongly Disagree, and 4 were “yes/no” questions..

In general, I was satisfied with the quality of instruction 1 – Strongly Agree and 5 – Strongly Disagree

The Distance Learning format suited my learning style. 1 – Strongly Agree and 5 – Strongly Disagree

I was satisfied with the amount of interaction I had with faculty. 1 – Strongly Agree and 5 – Strongly Disagree

I was satisfied with the amount of interaction with other students. 1 – Strongly Agree and 5 – Strongly Disagree

It was easy to get answers to my questions related to my program (e.g., academic rules, course requirements, degree requirements). 1 – Strongly Agree and 5 – Strongly Disagree

I was satisfied with NPS logistical support (e.g., book shipping, travel, classroom 1 – Strongly Agree and 5 – Strongly Disagree

I was satisfied with NPS technology support (e.g., computer related, Sakai learning management system). 1 – Strongly Agree and 5 – Strongly Disagree

I was satisfied with NPS administrative interaction (e.g., admissions, grades). 1 – Strongly Agree and 5 – Strongly Disagree

Professors were available for consultation. 1 – Strongly Agree and 5 – Strongly Disagree

Professors provided me with adequate feedback. 1 – Strongly Agree and 5 – Strongly Disagree

Professors presented the material in a clear manner. 1 – Strongly Agree and 5 – Strongly Disagree

I was satisfied with my professors. 1 – Strongly Agree and 5 – Strongly Disagree

The course was well organized. 1 – Strongly Agree and 5 – Strongly Disagree

The course materials were well designed. 1 – Strongly Agree and 5 – Strongly Disagree

Disagree

The program did not live up to my expectations. 1 – Strongly Agree and 5 – Strongly Disagree

Course content did not meet my educational needs. . 1 – Strongly Agree and 5 – Strongly Disagree

Course content was difficult. 1 – Strongly Agree and 5 – Strongly Disagree

The amount of coursework required **too much effort**. 1 – Strongly Agree and 5 – Strongly Disagree

Course objectives were clear. 1 – Strongly Agree and 5 – Strongly Disagree

Course objectives aligned with my needs. 1 – Strongly Agree and 5 – Strongly Disagree

The course(s) required me to be online or in a VTC at a specific time (synchronously). Yes/No

I could attend the course(s) online when and where I wanted (asynchronously). Yes/No

I took more than one course and experienced both types of formats (synchronous and asynchronous). Yes/No

Part of the course was taught with the professor in our facility and partly in a distance-learning environment. Yes/No

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- 7) Center for the Study of College Student Retention located at - <http://cscsr.org/References.html>

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