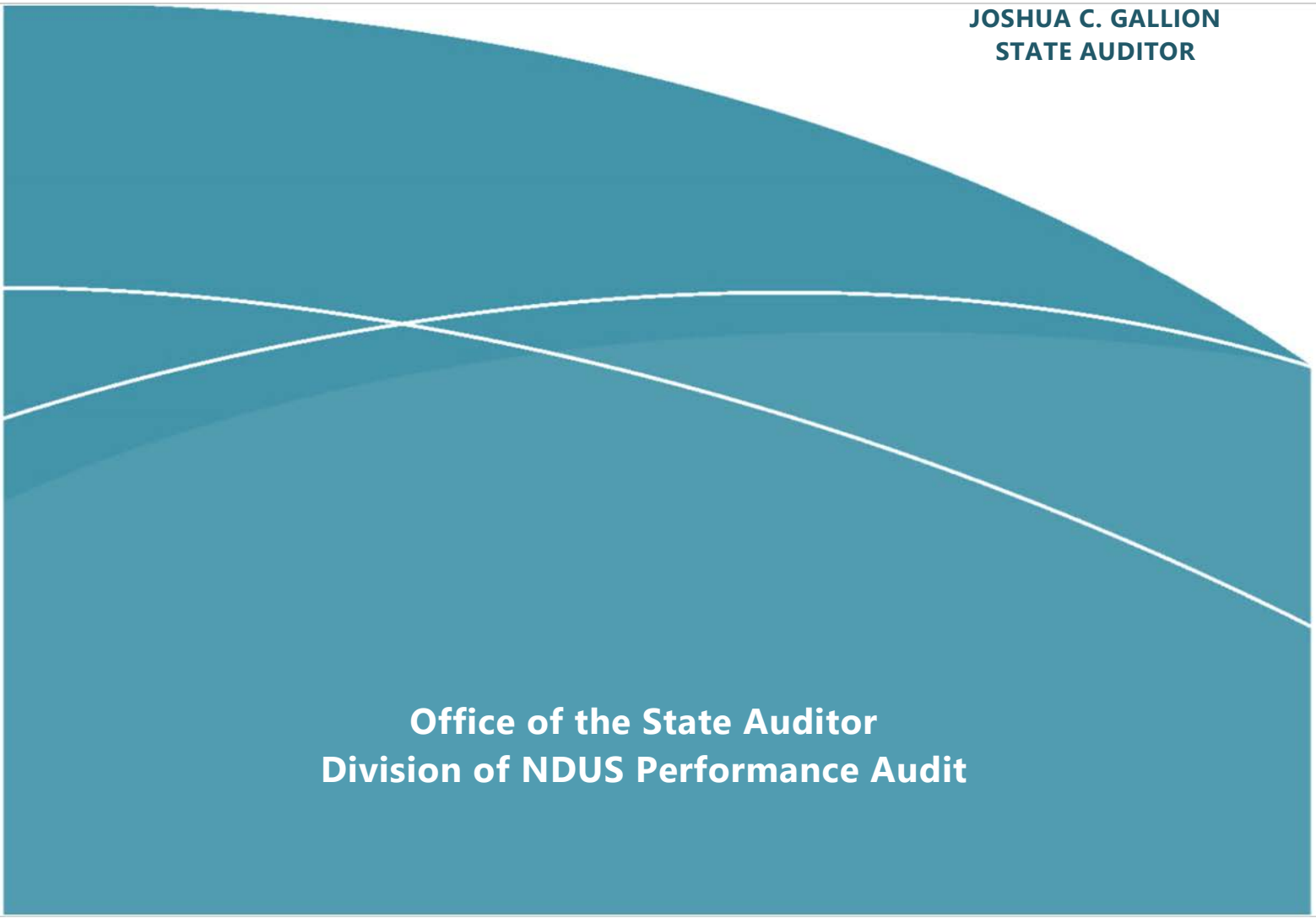
Performance Audit Report

NORTH DAKOTA UNIVERSITY SYSTEM
ONLINE EDUCATION

Report No. NP-013-18

November 9, 2018

JOSHUA C. GALLION
STATE AUDITOR



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Transmittal Letter

November 9, 2018

State Board of Higher Education
Members of the North Dakota Legislative Assembly

We are pleased to submit this performance audit. The subject matter of this audit included identifying potential savings by consolidating online courses within the North Dakota University System.

We conducted this audit under the authority granted within North Dakota Century Code Section 54-10-30. Included in the report are the audit scope and objectives, findings and recommendations, and management responses.

Craig Hashbarger, CPA, CIA, CFE was the audit manager. Inquiries or comments relating to this audit may be directed to the audit manager by calling (701) 239-7274. We wish to express our appreciation to the staff and management within the North Dakota University System for the courtesy, cooperation, and assistance they provided to us during this audit.

Respectfully submitted,

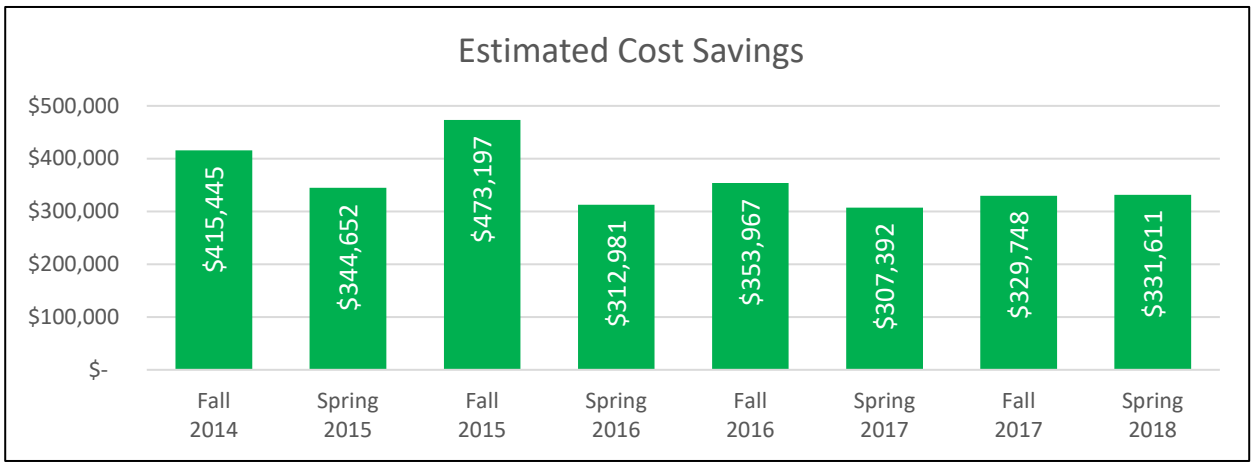
/S/

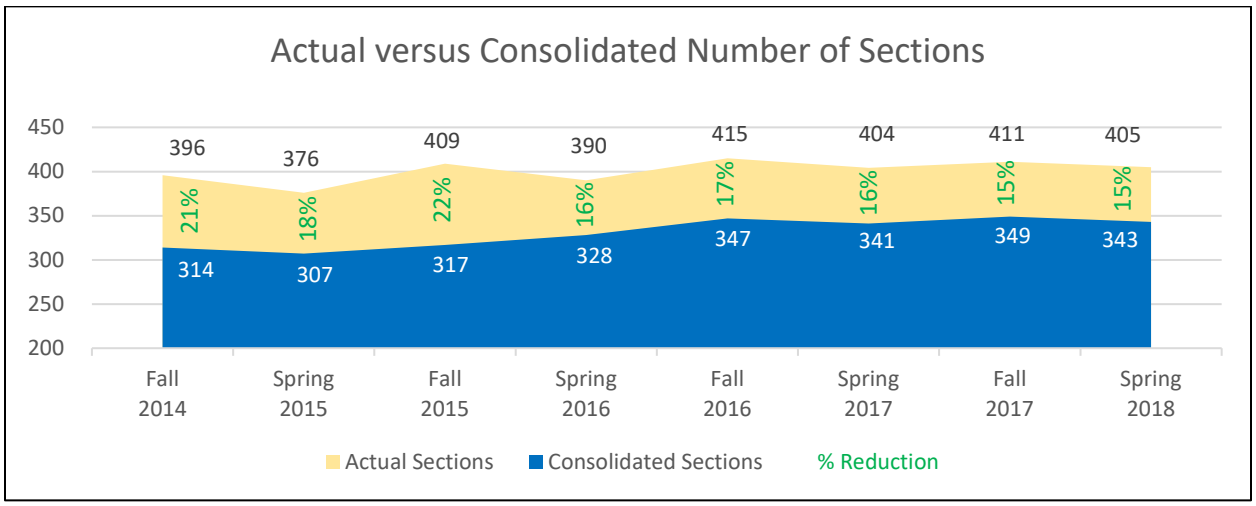
Joshua C. Gallion
State Auditor

Report Highlights

Online Course Consolidation Estimated Savings

From Fall 2014 to Spring 2018, it is estimated the North Dakota University System (NDUS) could have eliminated 560 online course sections (approximately 15% to 22% of online sections) and saved an estimated $2.9 million by consolidating certain online course sections without impacting the number of students served or number of courses offered. If online enrollment trends continue, future savings are estimated at up to $650,000 per year.





Action Items for Consideration

Consolidation of online classes will require the following actions:

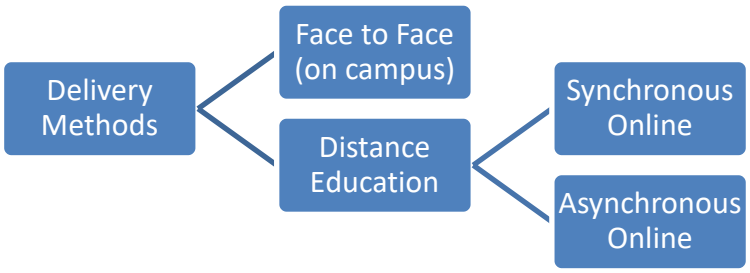
- Develop a tuition model to best meet the needs of NDUS and its students.
- Develop an equitable revenue sharing agreement for this model.
- Develop a policy for classification of credits.
- Develop consistent class sizes and adjunct compensation models for courses and/or subjects.

Background Information

Distance Education

In the United States, the number of students enrolling in institutions of higher education has decreased by 3% from 2012 to 2015. However, the number of students taking at least one distance education course increased by 11% from 2012 to 2015 (Allen & Seaman, 2017). NDUS student enrollment follows this national trend (Weber, Annual Enrollment Reports).

Distance education can be provided *synchronously* or *asynchronously*. All students enrolled in a synchronous online class must log in at scheduled class times; whereas students enrolled in an asynchronous online class may log in to the class when it is convenient for them to view lectures and/or complete course requirements.



Asynchronous online courses comprise 86% of NDUS distance education courses. The percentage of NDUS students taking at least one asynchronous online course increased from 47% in 2014 to 49% in 2017 (Weber, Annual Enrollment Reports). National and NDUS enrollment trends are discussed in more detail in Appendix A.

Course Consolidation

Strategy 4.2 of the State Board of Higher Education's (SBHE) strategic plan promotes creating efficiencies through shared programs and services (North Dakota University System, 2017). One area where NDUS can create efficiencies is through consolidation of online courses. For purposes of this audit, course consolidation is defined as the process of reviewing course enrollment across the system and offering shared sections available to all NDUS students. Course consolidation would allow NDUS to maximize student enrollment in each section; thereby reducing the number of course sections offered and leading to lower costs. Course consolidation would combine students from multiple institutions into one or more consolidated classes.

Due to the nature of asynchronous online courses, scheduling conflicts are eliminated making it conducive to online course consolidation. In addition, there is no need for the instructor to be in the same physical location as the students. For these reasons, we considered only asynchronous online courses for this analysis.

Audit Results

Statement of Objective and Conclusion

The objective of our audit was to answer the following question:

- In what ways would consolidating online courses impact the North Dakota University System?

We estimated NDUS could have eliminated 560 online course sections and saved $2.9 million from Fall 2014 to Spring 2018 (excluding summer semesters) if online courses had been consolidated. If online enrollment trends continue, future savings are estimated at up to $650,000 per year.

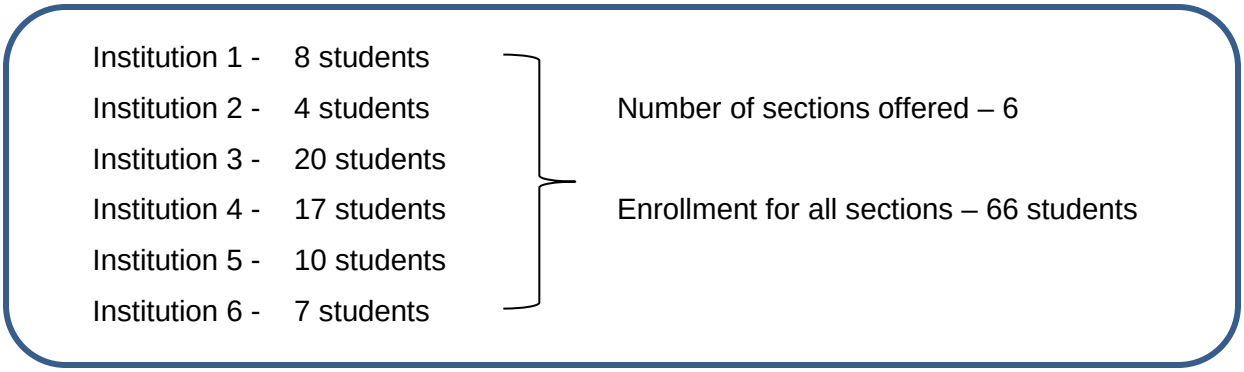
Scope

For this analysis we included only asynchronous online Remedial Academic Skills courses (college readiness courses that may be required prior to taking college level English, Math or other courses) and 100- and 200-level courses offered at three or more institutions during any given semester across NDUS (hereafter referred to as "online courses"). The period of this analysis includes Fall 2014 through Spring 2018. Summer semesters were excluded due to much lower enrollment and impact.

Findings, Recommendations, and Responses

We generated reports from PeopleSoft/Campus Solutions for student enrollment and course section data. We performed testing to determine maximum class sizes to apply in our analysis. Based on our results, we established class sizes of 22 students for English and communication courses and 25 students for all other courses. Details on testing performed can be found in the Methodology section. For purposes of this report, we used the maximum class sizes established to calculate the number of sections required if courses were consolidated across NDUS. The number of consolidated course sections was subtracted from the number of actual course sections to determine the estimated number of course sections that could have been eliminated.

As an example, an Economics course was offered Fall 2014 at six institutions. The total enrollment for each section is displayed below.



Following are the calculations performed to estimate the number of sections that could have been eliminated for this course. We used a class size of 25 students for this course.

Total Enrollment	÷	Class Size	=	Number of Consolidated Sections
66	÷	25 students	=	2.64

This would result in the following consolidated sections:

Consolidated Section 1 - 25 students

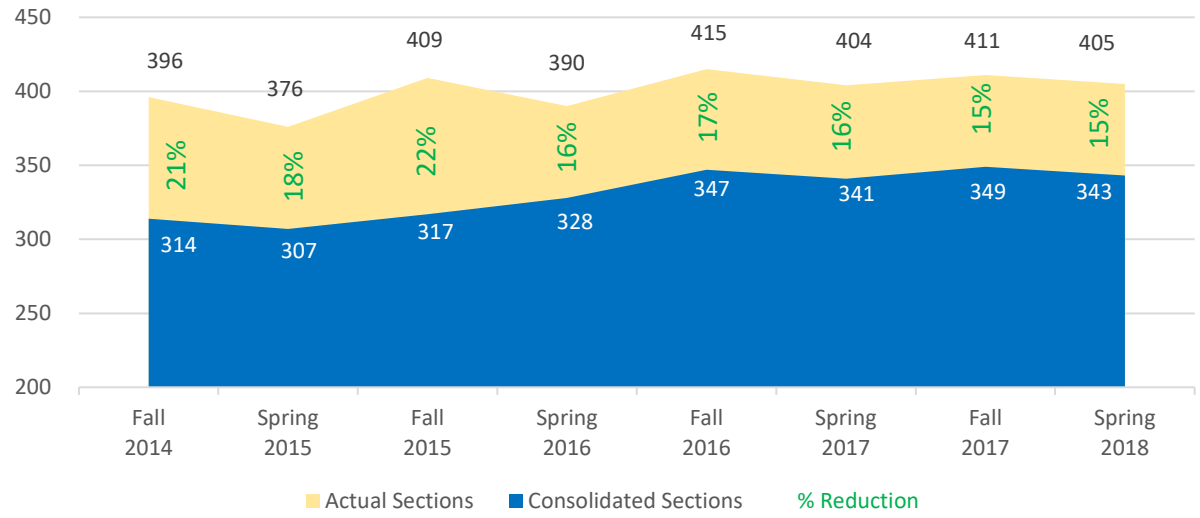
Consolidated Section 2 - 25 students

Consolidated Section 3 - 16 students

Actual Number Sections	–	Consolidated Number Sections	=	Number Sections Eliminated
6	–	3	=	**3 sections eliminated**
			x	$5,588 per section savings
			=	**$16,764 estimated savings**

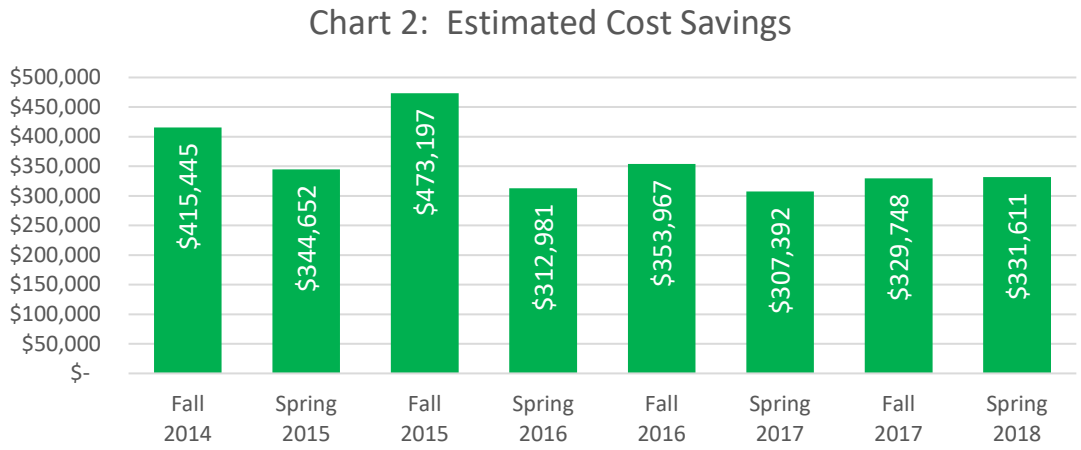
In the example above, it is estimated three sections of Economics in Fall 2014 could have been eliminated by consolidating online courses for an estimated cost savings of $16,764 (cost savings are discussed further in the next paragraph). Continuing this process for all online courses, we estimated NDUS could have eliminated 560 sections by consolidating online courses. As illustrated in the following chart, this is a reduction of 15% to 22% of online course sections each semester.

Chart 1: Actual versus Consolidated Number of Sections



The most significant savings that can be realized by consolidating online classes is instructor compensation. We developed an average instructor cost of $5,588 using information provided by management of the institutions and compensation data from PeopleSoft. Refer to details in the Methodology section. We multiplied the average instructor cost by the estimated number of course sections that could be eliminated. We identified potential cost savings of $2.9 million from Fall 2014 to Spring 2018.

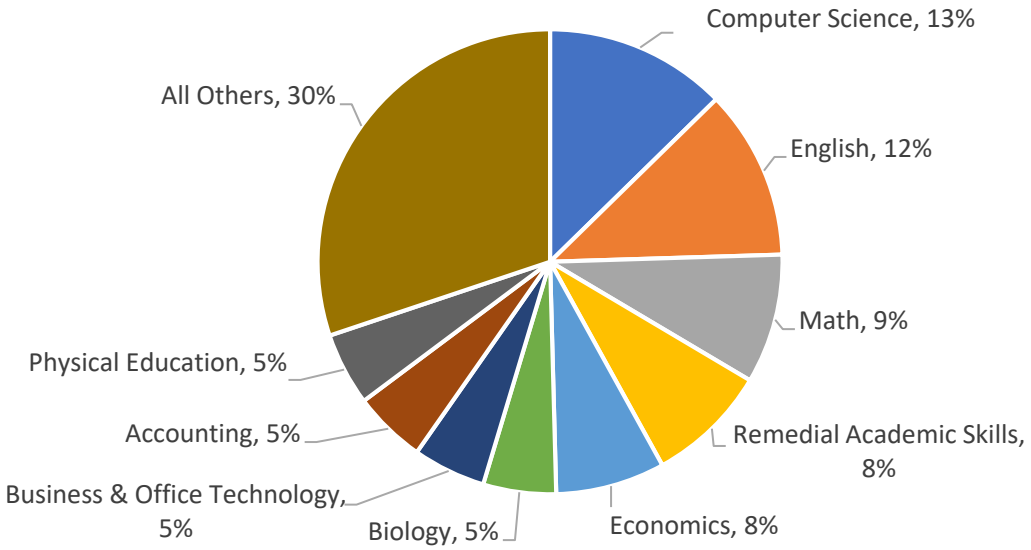
The chart below shows the cost savings by semester. If online education enrollment trends continue, future cost savings are estimated up to $650,000 per year.



In our analysis, we found on average 46% of the online course sections were taught by adjunct instructors. Adjunct instructors are hired on a contractual basis as needed by the institutions. As a result, the initial instructor savings would likely be in adjunct compensation. On the other hand, we anticipate instruction cost savings related to full-time faculty would be realized over time. In the short-term, the reduced number of online course sections could free up resources allowing faculty to focus on other activities. Longer term, this could alleviate the need to backfill and/or hire new positions.

The following chart shows the subjects with the greatest potential for savings from online course consolidation are Computer Science, English, Math, Remedial Academic Skills, Economics, Biology, Business & Office Technology, Accounting, and Physical Education.

Chart 3: Fall 2017- Spring 2018 Savings by Subject



Recommendation 1-1

We recommend management develop and implement a plan to consolidate online courses.

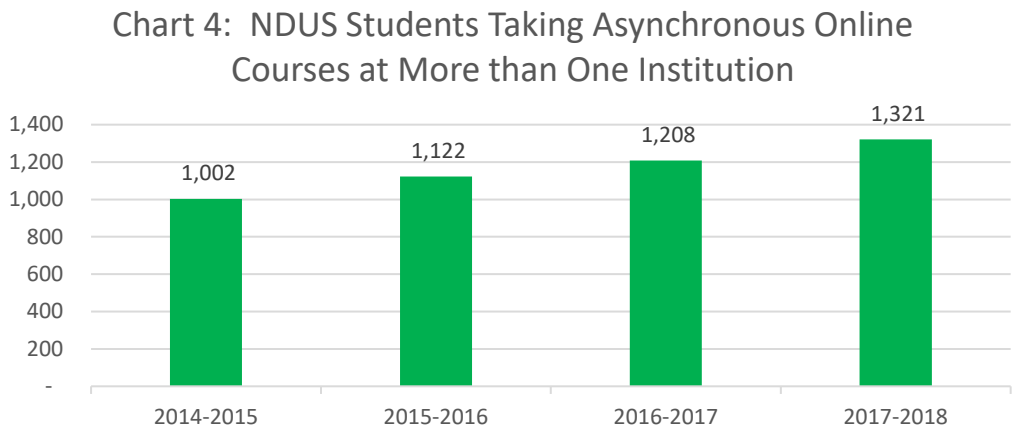
NDUS Response:

Partially agree. A significant number on online course are already consolidated and delivered across multiple institutions—including both public and tribal colleges in North Dakota. Two key discipline areas are the Dakota Nursing Program (DNP) and the Northern Information Technology Consortium (NITC) which deliver online courses via a single instructor to participating institutions in the subject areas of nursing and computer science. More recently, Lake Region State College, Dakota College at Bottineau, Williston State College and Minot State University are collaborating to provide consolidated online instruction, modeled after the DNP and the NITC to deliver ag-related coursework. Less frequent, but more organically derived, both two-year and four-year institutions have partnered using shared instructional resources to deliver online courses at both the undergraduate and graduate levels. For example, an economics instructor at Williston State College currently provides Econ instruction to Dakota College at Bottineau and Lake Region State College as the performance report suggests. The NDUS will continue to seek additional opportunities for the consolidation of online courses, where appropriate.

Barriers to Course Consolidation

Collaborative Student Process

The number of NDUS students taking asynchronous online courses at more than one institution has increased by 32% over the last four years, as indicated in the chart below.



Thus, the online course consolidation model we are recommending is not a new concept; NDUS, to some extent, is already implementing this model. We are recommending NDUS expand on the collaborative student process (defined below) to save costs.

NDUS's collaborative student process allows students to take classes at multiple NDUS institutions at the same time. We identified several components of the collaborative student process that would not work well under our proposed consolidation model. The significant areas that would need to be adjusted to fit the consolidated course model are listed below.

- **Tuition model**. Currently, the tuition for a collaborative class is based on the tuition at the institution providing the class, which likely differs from the student's home institution tuition. Also, if the student's home institution has a tuition cap (tuition capped after a certain number of credits), the collaborative classes are not included as part of the tuition cap. Therefore, it is common for students to pay additional tuition when taking a collaborative class.

- **Revenue sharing agreement**. Currently, there is no revenue sharing agreement with collaborative classes. All the tuition revenue is sent to the provider institution.

- **Classification of credits**. Credits from collaborative classes are considered transfer credits so collaborative classes are not included in the home institution's GPA calculation or counted toward institutional credit for degree purposes.

- **Restrictions.** There are several restrictions on taking a collaborative class, such as repeated classes cannot be taken as a collaborative class or a student must be enrolled in at least one credit at the home institution.

- **Manual process.** Parts of the collaborative student process have been automated, but there are still a lot of manual touchpoints, particularly the registration process.

We also researched the Tri-College University program. The Tri-College University is made up of five institutions: North Dakota State University, Minnesota State University Moorhead, Concordia College, North Dakota State College of Science, and Minnesota State Community and Technical College. A student from one of the member institutions can take a class at any of the other four institutions. The significant differences of the Tri-College University program from the collaborative student process are the following:

- A student at one of the Tri-College University member institutions can take a class at one of the other institutions without paying extra tuition.

- Credits from Tri-College University classes are treated as home institution credits and are therefore included in a student's home institution GPA.

Recommendation 1-2

We recommend NDUS develop a plan for addressing the current barriers to online consolidation, specifically tuition model, revenue sharing agreement and classification of credits.

NDUS Response:

Agree. The NDUS is mindful of pending recommendations from the Governor's Office and House Bill 1500 to form a three-board system of educational governance. Eminent barriers include coordinating instruction, policies, and processes across as many as three independent boards. The success of the NDUS' most extensive consolidated online instructional partnerships in nursing and computer science are largely dependent on a paid coordinator role. On a larger scale, some level of statewide online coordination would be necessary provided funding should become available.

Existing models of shared online instruction in the NDUS provide some guidance as to how revenue sharing and classification of credits can be effectively addressed. Generally, a coordinator ensures fairness in revenue sharing by ensuring that each institution contributes an equitable number of instructional hours to the consortia. Each institution lists the consolidated course on their respective term schedule of courses with the same course number, course title, and course instructor. Students register for the consolidated course at their respective home institution. Therefore, all credit appears on the academic transcript of the institution at which it was taken—eliminating any challenges associated with classification of credits. Fairness in revenue is attained with each institution collecting all revenue from students enrolled at their respective institution—also referred to as the "home" institution. Additionally, financial aid is processed correctly at the home institution with no need to invoke the collaborative registration process.

In less formal arrangements, the receiving institution(s) simply pay a negotiated portion of the instructional faculty member's salary to the providing institution.

Class Sizes

As part of our audit, we requested information on class sizes, including class minimums and maximums (class caps) from the 11 institutions. Most have standard caps for classes but with variations for some subjects. For example, most institutions stated the cap for COMM 110: Fundamentals of Public Speaking was lower than many other subjects. According to *A Framework for Evaluating Class Size in Online Education*, teaching intensity is far greater for advanced courses or courses requiring analysis, such as analysis of literary works, than for courses with large amounts of factual information, such as introductory Biology (Hoefflinger Taft, Perkowski, & Martin, 2011). It is, therefore, expected that some courses would have lower caps than others.

However, the caps for classes are not standard across the university system. Class caps were found to vary from a low of 15 to a high of 100, although most ranged from 18 to 25. In our analysis, we used a class size of 22 for English and Communication courses and 25 for all other courses.

The SB2003 Task Forces Final Report to the North Dakota SBHE considered class sizes. The report states in part that the SBHE "will have a system approach for the operation and function of academic program services that will provide for cost efficiency [cost reduction] for the system while providing students with educational opportunities...", specifically, a policy for class section sizes (Dakota Ed Consulting, 2018).

In addition to cost efficiencies, it would be beneficial for class sizes of similar courses to be consistent across NDUS to facilitate scheduling of consolidated asynchronous online course sections.

Our recommendation for consolidating sections would result in each section being filled before another section is added. Our testing identified adjunct compensation models at some of the institutions are based on the number of students per class. At those institutions, enrollment is lower than the caps. This could have unintended consequences by skewing compensation higher when those classes are at capacity.

Recommendation 1-3

We recommend NDUS review and develop, to the extent practicable, consistent class sizes and related compensation models for courses and/or subjects.

NDUS Response:

Partially agree. The NDUS acknowledges that more elaborate compensation models would need to be developed if consolidated online instruction efforts were scaled up significantly. Additionally, legal ramifications of academic freedom, textbook selection, and shared governance with faculty would need to be negotiated. The NDUS has responded to previous concerns reported to the Higher Learning Commission regarding shared governance with faculty and would be remiss if that aspect were not acknowledged in future endeavors.

The inclusion of faculty in policy formation, compensation models, and assessment will be necessary to provide a quality learning environment that supports the continuity of student-faculty relationships in the online environment, continuity of

student-student relationships with informal online cohorts, the selection of course textbooks or open educational resources (OERs) and the ability to support early warning and other student success initiatives to identify students who may be struggling in coursework among multiple institutions.

Methodology

Number of Course Sections

We generated reports from PeopleSoft/Campus Solutions from Fall 2014 to Spring 2018 for student enrollment and course section data for those courses within our scope. We reviewed the number of course sections and made the following adjustments to approximate the number of actual course sections:

- Reduced the number for sections that were likely combined with other sections, such as dual credit/early entry sections (i.e., high school students taking college credit), and

- Increased the number for sections with enrollment numbers that would trigger counting it as another class based on teaching load. We obtained information on teaching load from management of each institution. For example, at one institution, an instructor is compensated for two classes when it reaches 35 students. If the class enrollment was 38, this was counted as two sections.

We requested information on class minimums and maximums (class caps) for a sample of courses from the 11 institutions. We also researched external reports for typical class sizes. We used the median class caps, which closely aligned with the external report findings, for calculating the required number of sections when consolidating courses. The maximum class sizes used in our analysis were 22 students for English and Communication courses and 25 students for all other courses.

The method for calculating the number of consolidated course sections and an example are provided in the Findings, Recommendations, and Responses section of the report.

High-enrollment course sections over 40 students were excluded as those classes would not be consolidated with other sections. We also excluded lab sections in our analysis. We assumed class enrollments in the consolidated course model would use the class sizes of 22 or 25 as noted above. If NDUS implements different class sizes than those used in our analysis, actual savings will vary.

Based on information received from the institutions, most institutions allowed a small number of additional students over the class cap before creating a new section. Therefore, in our analysis we allowed up to five extra students above the maximum class sizes before creating a new section. For purposes of this report, if total enrollment in all sections of an accounting course was 105 students, there would be four sections offered. If the total enrollment in that same course was 106 students, five sections would be offered.

Costs of Offering an Online Class

We reviewed external reports for typical costs related to online courses, which included instructor compensation, technology costs, and other costs. We conducted interviews and requested information from management at the institutions to identify the specific costs to NDUS of offering an online class. We concluded the most significant cost that could be reduced by consolidating courses is instructor compensation.

We reviewed the instructor data of the online classes in our analysis. On average, 54% of the classes were taught by benefited faculty (20 hours or more a week) and 46% were taught by adjunct instructors. We gathered data from the 11 institutions on adjunct instructor compensation for six courses in different subjects. The median adjunct compensation for these six courses was $3,152.

Based on research of external reports and information requested from the institutions, a 3-credit class makes up, on average, 10% of a faculty's annual workload. We pulled the salary data from PeopleSoft and added an amount for retirement and health insurance. We multiplied the total compensation (salary plus benefits) by 10% to come up with the compensation attributable to a 3-credit class. The median benefited faculty compensation attributable to a 3-credit class was $7,663.

From the compensation information above, we developed a weighted average instruction cost of $5,588 for a 3-credit class. We used current compensation data for adjunct instructors (Fall 2018) and benefited faculty (as of spring 2018). We adjusted cost savings based on the credit hours for the course.

We considered graduate student teaching assistants in the adjunct instructor category. We assumed the value of their compensation (tuition waiver and stipend) attributable to a 3-credit class would be comparable to that of an adjunct instructor.

Estimated Cost Savings

To estimate the savings of consolidating online courses, we multiplied the weighted average instruction cost by the estimated number of course sections that could be eliminated. Refer to Chart 2 for results.

Our analysis didn't include courses offered at fewer than three institutions, 300-level or higher courses, or summer semester courses. There would be additional savings to any extent those courses are also consolidated.

Purpose and Authority

This performance audit of the North Dakota University System has been conducted by the Office of the State Auditor pursuant to authority within North Dakota Century Code Chapter 54-10.

Performance audits are defined as engagements that provide assurance or conclusions based on an evaluation of sufficient, appropriate evidence against stated criteria, such as specific requirements, measures, or defined business practices. Performance audits provide objective analysis so management and those charged with governance and oversight can use the information to improve performance and operations, reduce costs, facilitate decision making by parties with responsibility to oversee or initiate corrective action, and contribute to public accountability. The purpose of this report is to provide analysis, findings and recommendations with respect to the audit objectives.

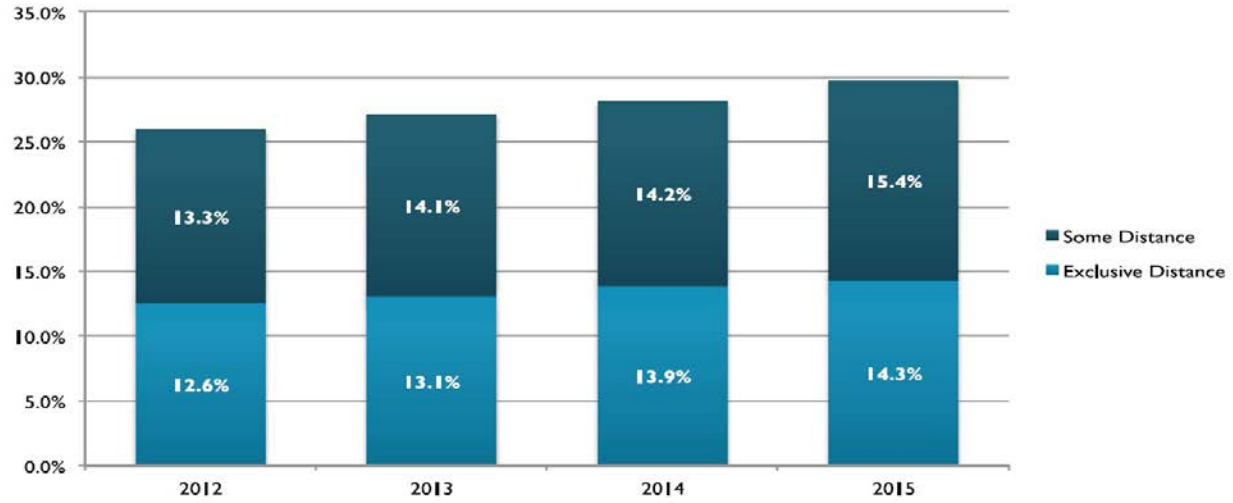
We conducted this performance audit in accordance with *Generally Accepted Government Auditing Standards*. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix A: Distance Education Trends

National Distance Education Trends

Nationally, the number of students taking at least one distance education course has steadily increased. The number of students taking at least one distance education course increased 3.9% from 2014 to 2015 and 11% from 2012 to 2015 (Allen & Seaman, 2017). As shown in the following graph, the proportion of the student body taking distance education courses has increased each year, from 25.9% in 2012 to 29.7% in 2015.

Chart 5: Percentage of Students Taking Distance Courses – 2012-2015



Source: Digital Learning Compass, 2017

North Dakota Distance Education Trends

According to the Digital Learning Compass: Distance Education State Almanac 2017, North Dakota's 20 degree-granting institutions saw a decrease in overall enrollment of 2.3% from Fall 2012 to Fall 2015. The population of all North Dakota students is 53,840 as of Fall 2015, of which 90% attend the public institutions and the other 10% attend private institutions (Seaman & Seaman, 2017).

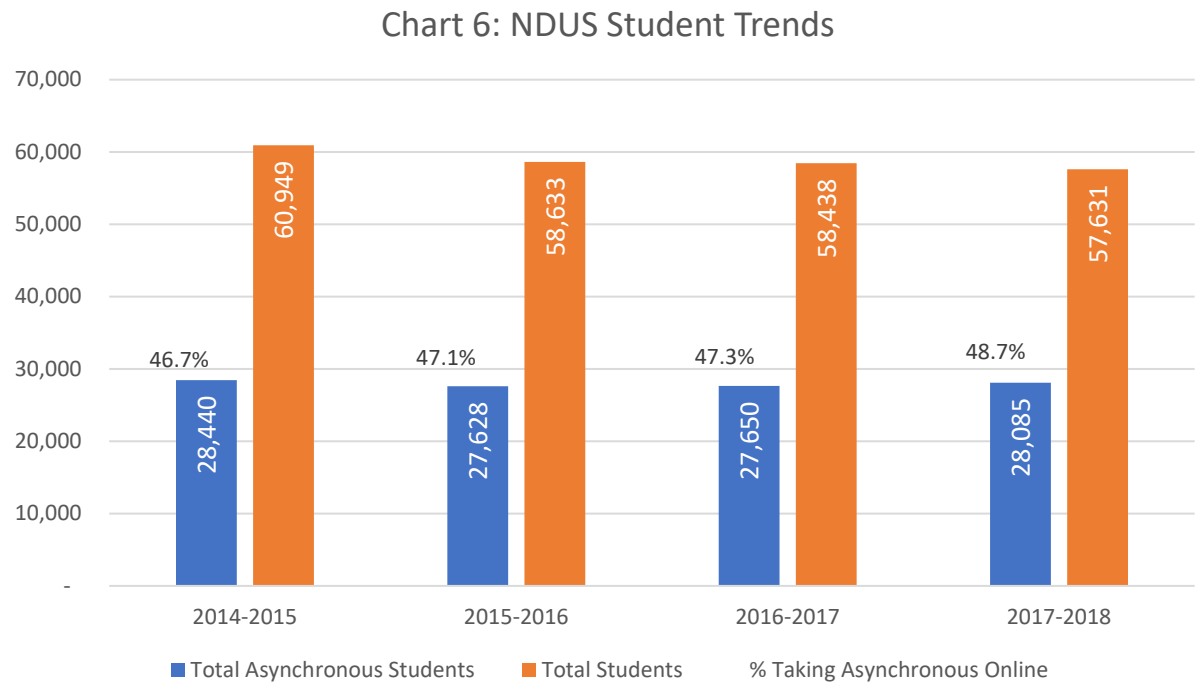
Of the enrolled student body in 2015, 23,736, or 44.1%, were taking at least one course at a distance, which is higher than the national average of 29.7%. The number of students taking distance education courses in the state increased by 10.8% between Fall 2012 and Fall 2015. Ninety-three percent of those students attended public institutions. In North Dakota, 13,096 students were taking all their courses at a distance, which represents 24.3% of all students enrolled in the state. This rate is higher than the national average of 14.3%. (Seaman & Seaman, 2017)

In summary, although overall student enrollment in North Dakota institutions decreased by 2.3% from Fall 2012 to Fall 2015, the number of students taking distance education courses increased by 10.8%. This indicates that more and more students are taking distance education courses. In

the 2017-2018 school year, 86.3% of the distance education courses were asynchronous online courses (Weber, 2017-18 Annual Enrollment Report, 2018).

NDUS Asynchronous Online Education Trends

The data from NDUS enrollment reports is shown in the following chart. Although total enrollment of unduplicated students has steadily declined, the percentage of those students taking asynchronous online courses has steadily increased from 46.7% in 2014 to 48.7% in 2017. Unduplicated student count means an individual student is only counted once, regardless of enrollment at more than one institution. All numbers in the chart below are unduplicated students. (Weber, Annual Enrollment Reports)



Source: NDUS Annual Enrollment Reports, 2015, 2016, 2017, 2018

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