

## EXECUTIVE SUMMARY

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**Item Name:      Learner Centered Education Course Redesign Initiative (LCE CRI)  
                    Final Report**

Action Item            Discussion Item            Information Item

**Issue:** The Board will receive a final report on the outcomes of the two-year LCE Course Redesign Initiative. The redesigned courses were fully implemented in the Fall 2008, and final outcomes related to student learning improvements and cost savings/reductions will be provided.

### Background

In 2001 the Arizona Board of Regents authorized \$500,000 of the TRIF Regents Innovation Fund from Proposition 301 monies for grants to faculty to improve and expand learner-centered education (LCE) throughout the Arizona University System. The purpose of learner-centered education is to change the dynamics of student-faculty interaction to optimize students' learning and learning outcomes (focusing on what is learned rather than on what is taught); to utilize technology to create opportunities for student learning; to utilize student peer interaction (collaborative learning); and to create more active learning venues for students beyond the standard lecture and discussion method.

In July 2007 the Board allocated \$1 million for a two-year LCE initiative based on the successful course redesign model pioneered by the National Center for Academic Transformation (NCAT). The LCE Course Redesign Initiative (CRI), to be managed by NCAT consultants over the two-year period, was intended to:

- Redesign high-enrollment undergraduate courses to demonstrably improve student learning outcomes;
- Reduce per-student costs of instruction in the redesigned courses;
- More effectively align existing institutional resources; and
- Develop internal capacity to redesign additional courses beyond the project funding period.

The NCAT process requires faculty teams to follow a very structured iterative course redesign development and selection process. Of the initial 27 faculty proposals, 13 projects were selected for redesign grants in August 2007, based on NCAT's standards for successful redesign projects nationwide:

- The team has selected an appropriate course to redesign (large-enrollment, undergraduate, "gateway").
- The redesign plan has a good chance of improving student learning.
- The plan to assess the impact of course redesign on student learning is sound.

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- The redesign plan will produce cost savings.
- The redesign plan can be implemented within the project time frame.

The 13 projects were guided through a pilot phase, in Spring 2008, to test and refine their redesign strategies. Following the pilot phase, three projects were discontinued primarily due to personnel and timing issues. The remaining 10 followed through to full implementation of their redesigned courses in Fall 2008:

- ASU General Chemistry
- ASU Computer Literacy
- ASU Physical Geology
- ASU Organizational Behavior and Leadership
- ASU Public Speaking
- ASU Women and Society
- NAU Introduction to Psychology
- UA Introductory Biology
- UA Chemistry
- UA Geology

The 10 projects submitted their outcome data from the Fall 2008 semester to NCAT in March 2009 and shared their full final reports in a project conference on April 2, 2009.

### Strategic Implications

The LCE CRI clearly addresses two goals of the 2020 Vision System-wide Strategic Plan:

- **Goal 1 - Educational Excellence**, by developing approaches to course delivery which improve learning and/or increase capacity while retaining or increasing academic performance; and
- **Goal 4 - Productivity**, by maximizing the use of resources with greater effectiveness.

### Discussion

This report presents NCAT's compilation of the final data on the 10 course redesign projects individually and collectively, addressing the questions:

- Did student learning improve?
- Did course completion rates improve?
- Were costs reduced?
- Will the redesign be sustained and/or expanded?

NCAT has prepared a detailed final project report and analysis, which is being made available separately.

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### **Detailed Project Outcomes**

- Please see Attachment A, “LCE CRI Summary,” and Attachment B, “LCE-CRI Projected and Actual Costs and Cost Reductions,” for details on:
  - Total annual cost and savings, by course and by total LCE CRI initiative
  - Cost per student and cost reductions, by course
- Please see Appendix #3, “NCAT’s Summary of the LCE CRI Course Redesign Projects’ Final Reports,” for reported results and explanations for individual projects in:
  - Student learning outcomes
  - Course completion rates
  - Reduction in instructional costs
  - Sustainability of redesigned course

### **Overview of Project Outcomes**

NCAT compiled the following summary data based on a review of all 10 final project reports.

1. ***Student Learning:*** Did student learning in the redesigned course improve, as measured by direct comparisons of content mastery?

5 = Yes – scores measurably improved on substantially similar assessments

2 = Yes – scores show no difference, but course is significantly more challenging

3 = No difference – learning outcomes were comparable to traditional format

2. ***Course Completion:*** Did course completion rates improve, as measured by comparisons of final course grades?

5 = Yes

1 = No difference, but significantly more difficult course

2 = No difference: Course completion was not an issue and was equivalent to traditional format, at 90% and 93%

2 = No, course completion rates were unchanged

3. ***Cost Reduction:*** Were instructional costs reduced?

10 = Yes (in addition, 4 projects saved more than originally projected)

(Please see “Summary of Cost and Cost Reductions Results,” below.)

4. ***Sustainability:*** Will the redesign be sustained after the grant period is over?

8 = Yes

2 = Questionable

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### **Students Impacted**

It is also worth noting that more than 14,000 students were enrolled in, and therefore directly impacted by, the redesigned courses during the Fall 2008 semester. Total *annual* enrollment in the redesigned courses is estimated at more than 21,000 students. Many of the projects plan to further increase enrollment as part of the ongoing redesign, raising the number of students impacted even higher in coming semesters.

### **Summary of Cost and Cost Reductions Results**

As shown on Attachment A, NCAT's analysis of the final project reports reveals the following key cost and cost reductions results:

1. **Total Annual Cost and Cost Reductions, By Course and by Total LCE CRI Initiative:** Across all 10 completed course-redesign projects, total annual cost reductions are calculated at \$1,223,432.
  - a. This represents an overall cost reduction of 28% (compared with the annual cost of \$4,386,900 for offering the courses in the traditional, pre-redesign format).
  - b. Total annual savings were within 2.2% of the projected savings of \$1,250,912.
  - c. On a course-by-course basis, total annual cost reductions range from \$36,000 (NAU Introduction to Psychology) to \$302,400 (UA Geology).
  - d. The average course-level cost reduction was 37%, ranging from 13% (UA Chemistry) to 59% (ASU Organizational Behavior and Leadership).
  
2. **Cost Per Student and Cost Reduction, by Course:** Overall, the redesigned courses saved \$93 per student in instructional costs compared with the traditional course delivery methods.
  - a. This is within 2.2% of the projected per-student saving of \$95.
  - b. On a course-by-course basis, cost reduction per student ranged from \$18 (NAU Introduction to Psychology) to \$252 (UA Geology).

The cost reductions calculated by NCAT were achieved by a number of means through the redesign process, including:

- Transferring portions of the class to on-line or distance-learning format
- Reconfiguring the staffing: Use of graduate teaching assistants, undergraduate teaching assistants, faculty adjuncts, etc.
- Integrating technology into the teaching/learning experience and/or classroom management practices
- Reconfiguring classroom/laboratory space to accommodate larger numbers of students
- Increasing student-enrollment capacity without additional resources

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### **Sustainability of the Redesigned Courses**

Both the final reports and the team presentations at the project conference on April 2 clearly show the faculty teams' high level of enthusiasm for the redesign process and their own project results. Project teams unanimously supported the continuation of the redesigned courses, and many are already working to apply similar redesign strategies to other courses in their departments. (Please see Appendix #3 for comments and observations on sustainability for each course.)

### **Collaborative Oversight and Management**

From the outset, the LCE CRI grant program has been a collaborative initiative among Regents, faculty, and university administrators.

- **ABOR Academic Affairs Committee.** The Board of Regents' Academic Affairs Committee provides executive oversight for the LCE program, approves funding for grants, and approves substantive changes to grant process/criteria. Members of the Academic Affairs Committee include three Regents; the three University provosts; and faculty representatives.
- **The LCE Advisory Council.** The LCE Advisory Council is made up of appointees by each of the three university provosts; and Arizona Faculties Council members representing each of the three universities. The Council provides operational expertise and guidance to ABOR staff on managing the LCE program and develops recommendations for the Academic Affairs Committee on project funding and other key program issues.

### **Next Steps**

NCAT's rigorous analysis of all project data provides the foundation for solid decision-making about the next steps for the Learner-Centered Education grant program. The LCE Advisory Council has already discussed a number of options for continuing, expanding, and/or revising the annual LCE grant program. The Council will revisit these discussions in light of the LCE CRI program results and present its recommendations to the Academic Affairs Committee, with the expectation of initiating a new round of LCE program funding by the end of 2009.

### **Additional Information**

The full report, "ABOR-NCAT Final Report 2006-2009," is available on the ABOR website at: <http://www.azregents.edu>

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Please find the following information on pages:

	Pages
<b>Attachment A:</b> LCE CRI Summary Results	7-8
<b>Attachment B:</b> LCE CRI Projected and Actual Costs and Cost Reductions	9-10

### **Appendix**

NCAT's Summary of the LCE CRI Course Redesign Projects' Final Reports

### **Recommendation**

This report is provided for information. Input from the Regents is welcomed.

**EXECUTIVE SUMMARY****Summary Results, LCE CRI Project Full Implementation – Fall 2008  
April 2, 2009**

Course	Two-Year Actual Grant Funding	Total Students in Fall 2008	Learning Outcomes ?	Course Completion Rates ?	Continue Redesign ?	Cost Savings Based on Full Implementation Semester	
						Basis for Actual Cost Savings	Actual Annual Savings*
ASU: ACC 230: Uses of Accounting Information I	\$25,143	Project funding discontinued after pilot semester – funding of \$25,143 represents 50% of initial authorized award					
ASU: CHM 101: General Chemistry (all three campuses)	\$100,000	4,300	No difference	Improved	Yes	<ul style="list-style-type: none"> <li>▪ \$842,562 – reduced GTAs from 101 to 77 annually</li> <li>▪ \$40,458 – 8.5 GTAs replaced w/5 FT instructors</li> <li>▪ Space needs reduced considerably</li> </ul>	\$883,020
ASU: College Algebra	\$25,000	Project funding discontinued after pilot semester – funding of \$25,000 represents 50% of initial authorized award					
ASU: CSE 180: Computer Literacy	\$51,763	2,000	Improved	Improved	Yes	Per-student costs reduced 34% - from \$50 to \$33 each	\$68,000
ASU: GLG 101 Introduction to Geology I, Physical	\$52,911	1,200	Improved	Improved, with more challenging course	Yes	<ul style="list-style-type: none"> <li>• Time savings of 30% for instructors</li> <li>• Time savings of 35% for TAs</li> <li>• Estimated \$24/student savings</li> </ul>	\$57,600
ASU Poly: MGT 300 Organizational Behavior and Leadership	\$49,665	240	Improved	No change – already 93%	Yes	<ul style="list-style-type: none"> <li>• 59% reduction in per-student costs (from \$373 to \$159)</li> <li>• In future, classroom will accommodate 500 (up from 360)</li> </ul>	\$102,720
ASU: CMN 225: Public Speaking	\$41,178	200	No difference	Slight decline	Not decided	<ul style="list-style-type: none"> <li>• Saved \$200 per student by doubling enrollment</li> <li>• Capacity to triple enrollment with no additional resources</li> </ul>	\$80,000
ASU: WST 100 Women and Society; WST 300 Women in Contemporary Society	\$45,218	1,400	Improved	Slight decline	Yes	<ul style="list-style-type: none"> <li>• Reduced cost-per-student by 27%, from \$78 to \$57</li> <li>• Able to serve 1,200 students with 3 faculty</li> </ul>	\$58,800
NAU: BIO 181 Introductory Biology	\$24,719	Project funding discontinued after pilot semester – funding of \$24,719 represents 50% of initial authorized award					
NAU: PSY 101 Introduction to Psychology	\$49,992	1,925	Same but more difficult course	Same but more difficult course	Yes	Cost per student reduced 30%, from \$62 to \$43 (compared with estimated 23% projected)	\$73,150
UA: MCB 181: Introductory Biology	\$50,000	1,800	Improved	Improved	Yes	Restaffing and increased enrollment reduced per-student costs (estimated; final figures to come)	\$229,500
UA: CHEM 103/104: Fundamentals of Chemistry (and lab)	\$49,911	2,000	Improved	Improved	Yes	Reduced course planning and student contact hours (estimated; final figures to come)	\$50,000
UA: NATS 101 A Geological Perspective	\$50,331	1,200	No difference	No change – already 90%	Not decided	Restaffing (estimated; final figures to come)	\$310,800
<b>TOTALS:</b>	<b>\$615,831</b>	<b>16,268</b>				<b>Savings average \$117.62 per student</b>	<b>\$1,913,590</b>

\*Based on the assumption of two full semesters annually at same enrollment level as Fall 2008

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**ABOR LCE-CRI SUMMARY**

25-May-09

**Table 1. Total Annual Cost and Cost Reduction, by Course and by Total LCE CRI Project:**

Institution/Course:	Annual Enrollment	TOTAL ANNUAL COST:				Total Annual \$ Savings	Total % Savings
		Traditional (historic)	Redesign -				
			Projected	Actual			
ASU Chemistry	4,540	\$1,616,240	\$1,362,000	\$1,362,000	\$254,240	16%	
ASU ^ Computer Literacy	2,196	\$109,800	\$84,448	\$61,488	\$48,312	44%	
ASU Geology	2,200	\$202,400	\$149,600	\$129,800	\$72,600	36%	
ASU ^ Org Mgmt & Leadership	360	\$134,280	\$57,240	\$55,440	\$78,840	59%	
ASU ^ Public Speaking	600	\$205,200	\$85,200	\$85,200	\$120,000	58%	
ASU ^ Women in Society	2,800	\$218,400	\$159,600	\$159,600	\$58,800	27%	
NAU ^ Intro to Psychology	2,000	\$120,000	\$96,000	\$84,000	\$36,000	30%	
UA Biology	1,730	\$460,180	\$224,900	\$307,940	\$152,240	33%	
UA Chemistry	4,000	\$796,000	\$696,000	\$696,000	\$100,000	13%	
UA Geology	1,200	\$524,400	\$222,000	\$222,000	\$302,400	58%	
<b>TOTAL, All Courses:</b>	<b>21,626</b>	<b>\$4,386,900</b>	<b>\$3,136,988</b>	<b>\$3,163,468</b>	<b>\$1,223,432</b>	<b>28%</b>	
<b>AVERAGE Percent Savings by Course:</b>						<b>37%</b>	

**Table 2. Cost Per Student and Cost Reduction, by Course:**

institution/Course:	Annual Enrollment	COST PER STUDENT, BY COURSE:			\$\$ Savings per Student		% Savings Per Student, by Course	
		Traditional (historic)	Redesign -		Projected	Actual	Projected	Actual
			Projected	Actual				
ASU Chemistry	4,540	\$356	\$300	\$300	\$56	\$56	16%	16%
ASU ^ Computer Literacy	2,196	\$50	\$38	\$28	\$12	\$22	24%	44%
ASU Geology	2,200	\$92	\$68	\$59	\$24	\$33	26%	36%
ASU ^ Org Mgmt & Leadership	360	\$373	\$159	\$154	\$214	\$219	57%	59%
ASU ^ Public Speaking	600	\$342	\$142	\$142	\$200	\$200	58%	58%
ASU ^ Women in Society	2,800	\$78	\$57	\$57	\$21	\$21	27%	27%
NAU ^ Intro to Psychology	2,000	\$60	\$48	\$42	\$12	\$18	20%	30%
UA Biology	1,730	\$266	\$130	\$178	\$136	\$88	51%	33%
UA Chemistry	4,000	\$199	\$174	\$174	\$25	\$25	13%	13%
UA Geology	1,200	\$437	\$185	\$185	\$252	\$252	58%	58%

^ = Adds students

**EXECUTIVE SUMMARY****LCE CRI Projected and Actual Costs and Cost Reductions****Table 1. ABOR LCE-CRI Projected Savings Summary**

Institution	Course	Cost per Student		Savings per Student	% Savings by Course
		Traditional	Redesign		
UA	Chemistry	\$199	\$174	\$25	13%
ASU	Chemistry	\$356	\$300	\$56	16%
NAU	Intro to Psychology	\$60	\$48	\$12	20%
ASU	Computer Literacy	\$50	\$38	\$12	24%
ASU	Geology	\$92	\$68	\$24	26%
ASU	Women in Society	\$78	\$57	\$21	27%
UA	Biology	\$266	\$130	\$136	51%
ASU	Org Mgmt & Leadership	\$373	\$159	\$214	57%
ASU	Public Speaking	\$342	\$142	\$200	58%
UA	Geology	\$437	\$185	\$252	58%
<b>AVERAGE SAVINGS per course:</b>					<b>35%</b>

Institution	Course	Annual Enrollment	Annual Cost		Annual Savings
			Traditional	Redesign	
NAU	^ Intro to Psychology	2,000	\$120,000	\$96,000	\$24,000
ASU	^ Computer Literacy	2,196	\$109,800	\$83,448	\$26,352
ASU	Geology	2,200	\$202,400	\$149,600	\$52,800
ASU	^ Women in Society	2,800	\$218,400	\$159,600	\$58,800
ASU	^ Org Mgmt & Leadership	360	\$134,280	\$57,240	\$77,040
UA	Chemistry	4,000	\$796,000	\$696,000	\$100,000
ASU	^ Public Speaking	600	\$205,200	\$85,200	\$120,000
UA	Biology	1,730	\$460,180	\$224,900	\$235,280
ASU	Chemistry	4,540	\$1,616,240	\$1,362,000	\$254,240
UA	Geology	1,200	\$524,400	\$222,000	\$302,400
<b>TOTAL</b>		<b>21,626</b>			<b>\$1,250,912</b>

^ Adds students

**EXECUTIVE SUMMARY****Table 2. ABOR LCE-CRI Actual Savings Summary**

Institution	Course	Cost-per-Student		Savings per Student	% Savings by Course
		Traditional	Redesign		
UA	Chemistry	\$199	\$174	\$25	13%
ASU	Chemistry	\$356	\$300	\$56	16%
ASU	Women in Society	\$78	\$57	\$21	27%
NAU	Intro to Psychology	\$60	\$42	\$18	30%
UA	Biology	\$266	\$178	\$88	33%
ASU	Geology	\$92	\$59	\$33	36%
ASU	Computer Literacy	\$50	\$28	\$22	44%
ASU	Public Speaking	\$342	\$142	\$200	58%
UA	Geology	\$437	\$185	\$252	58%
ASU	Org Mgmt & Leadership	\$373	\$154	\$219	59%
<b>AVERAGE SAVINGS per course:</b>					<b>37%</b>

Institution	Course	Annual Enrollment	Annual Cost		Annual Savings	
			Traditional	Redesign		
NAU	^	Intro to Psychology	2,000	\$120,000	\$84,000	\$36,000
ASU	^	Computer Literacy	2,196	\$109,800	\$61,488	\$48,312
ASU	^	Women in Society	2,800	\$218,400	\$159,600	\$58,800
ASU		Geology	2,200	\$202,400	\$129,800	\$72,600
ASU	^	Org Mgmt & Leadership	360	\$134,280	\$55,440	\$78,840
UA		Chemistry	4,000	\$796,000	\$696,000	\$100,000
ASU	^	Public Speaking	600	\$205,200	\$85,200	\$120,000
UA		Biology	1,730	\$460,180	\$307,940	\$152,240
ASU		Chemistry	4,540	\$1,616,240	\$1,362,000	\$254,240
UA		Geology	1,200	\$524,400	\$222,000	\$302,400
<b>TOTAL</b>			<b>21,626</b>			<b>\$1,223,432</b>

^ Adds students