MHEC
MARYLAND HIGHER EDUCATION COMMISSION

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The Costs of Developmental Education

Prepared by:

Developmental Education Costs and Best Practices Workgroup

As Requested by the Report of the Chairmen of the Senate Budget and Taxation Committee and House Appropriations Committee

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MARYLAND HIGHER EDUCATION COMMISSION
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The 2010 Joint Chairmen's report required the Maryland Higher Education Commission (MHEC), in collaboration with the Maryland Association of Community Colleges, the University System of Maryland and Morgan State University to submit a report detailing the instruction costs of developmental education at each of the State's colleges and universities, a review of best practices nationwide and at Maryland's higher education institutions and a discussion of institutions that are most successful at providing quality developmental education programs efficiently as measured by student progression and cost. The language of the JCR stated:

> *"The committees are concerned about how much Maryland's colleges and universities and students are spending on developmental education. The Maryland Higher Education Commission (MHEC), in conjunction with the Maryland Association of Community Colleges (MACC), the University System of Maryland (USM), and Morgan State University (MSU) should submit a report detailing the instruction costs of developmental education at each of the State's colleges and universities.*
>
> *The report should include comparable developmental education costs on a per section, per full-time equivalent student, and per hour basis and an explanation of what the costs pay for and how the courses are delivered. The report should also include a review of best practices nationwide and at Maryland's higher education institutions, and a discussion of institutions that are most successful at providing quality developmental education programs efficiently as measured by student progression and cost."*

To examine and address both the cost and best practices components of the request, MHEC convened two separate intersegmental workgroups. The first was composed of MHEC, MACC and USM staff and communicated and collaborated with staff at Morgan State University to collect and compile developmental education enrollment and cost data. The second workgroup, composed of MHEC staff, representatives from the community colleges and Morgan State University and USM staff, discussed best practices for developmental education.

Part I.
Developmental Education Enrollment and Cost Data Collection

The first workgroup held several meetings between May and November 2010 to discuss and determine what data would be needed for both enrollments and costs for developmental education at the institution level. After designing an enrollment collection survey, the template was shared with the institutions in both segments for their reaction and input. The survey was then modified to incorporate the institutional recommendations and is provided in Appendix A.

Developmental Education Enrollment

To measure the cost of developmental education provided by the two- and four-year public institutions in Maryland, the workgroup first collected both headcount and credit hour data for enrollment in developmental education courses. This data was collected through the enrollment survey at both the aggregate level and broken down by course sections. The survey document is provided as Appendix A. The first collection of the data focused on the 2008-2009 Academic and Fiscal Year, since that was the most recent year for which actual data were available.

Table 1. Institutional Enrollment in Developmental Education FY 2009

Institution	Developmental Education FTES FY 2009	Percent of Total Developmental Education FTES FY 2009
Allegany College	235.63	2.0%
Anne Arundel Community College	976.83	8.3%
Baltimore City Community College	1,171.77	10.0%
Community College of Baltimore County	1,620.05	13.8%
Carroll Community College	353.33	3.0%
Cecil College	215.00	1.8%
College of Southern Maryland	323.80	2.8%
Chesapeake College	238.07	2.0%
Frederick Community College	399.73	3.4%
Garrett College	108.93	0.9%
Hagerstown Community college	351.80	3.0%
Harford Community College	431.97	3.7%
Howard Community College	561.40	4.8%
Montgomery College	1,852.37	15.7%
Prince George's Community College	1,039.57	8.8%
Wor-Wic Community College	351.60	3.0%
Community Colleges	**10,231.85**	**86.9%**
Bowie State University	185.13	1.6%
Coppin State University	247.20	2.1%
Frostburg State University	34.70	0.3%
Salisbury University	-	0.0%
Towson University	105.60	0.9%
University of Baltimore	48.90	0.4%
UM, Baltimore	-	0.0%
UM Baltimore County	5.70	0.0%
UM, College Park	*	*
UM Eastern Shore	275.90	2.3%
UM University College	274.70	2.3%
Morgan State University	359.10	3.1%
St. Mary's College of Maryland	-	0.0%
Public Four-Year	**1,536.93**	**13.1%**
Total	**11,768.78**	**100.0%**

Source: Institutional Surveys performed by Maryland Association of Community Colleges, University System of Maryland and Maryland Higher Education Commission, July 2010

The data collected through the surveys show that remedial and developmental education is predominantly provided at the State community colleges. As Table 1 shows, 86.9 percent of all remedial/developmental education enrollments, or 10,231.85 FTES, are enrolled in community colleges. The public four-year institutions account for 13.1 percent, or 1,536.93 of the total 11,768.78 developmental/remedial education FTES reported for 2008-2009. Data for the University of Maryland, College Park was not included because the university explained that developmental education programs are so specific and different that comparative data could not be provided. An explanation of developmental education at College Park is provided later in the report.

Within the community colleges, the range of developmental or remedial enrollments account for 9.32 percent of total enrollment at Allegany College for the lowest level to 24.0 percent of overall enrollment at Baltimore City Community College as the highest percent. A breakdown of enrollments in developmental education for each community college is provided in Table 2.

Table 2. Community College Enrollment
FY 2009

Institution	FTES FY 2009	Developmental Education FTES FY 2009	Percent of Total FTES for Developmental Education FY 2009
Allegany College	2,527.20	235.63	9.32%
Anne Arundel Community College	9,815.98	976.83	9.95%
Baltimore City Community College	4,881.90	1,171.77	24.00%
Community College of Baltimore County	12,914.77	1,620.05	12.54%
Carroll Community College	2,327.23	353.33	15.18%
Cecil College	1,497.48	215.00	14.36%
College of Southern Maryland	1,586.30	323.80	20.41%
Chesapeake College	1,586.30	238.07	15.01%
Frederick Community College	3,734.73	399.73	10.70%
Garrett College	641.25	108.93	16.99%
Hagerstown Community college	2,708.30	351.80	12.99%
Harford Community College	3,859.83	431.97	11.19%
Howard Community College	5,236.43	561.40	10.72%
Montgomery College	16,373.10	1,852.37	11.31%
Prince George's Community College	7,352.13	1,039.57	14.14%
Wor-Wic Community College	2,343.40	351.60	15.00%
Total	**79,386.33**	**10,231.85**	**12.89%**

Source: Institutional Surveys performed by Maryland Association of Community Colleges and Maryland Higher Education Commission, July 2010

Within the public four-year institutions, enrollment collection of developmental education enrollment was limited to the undergraduate level only, where developmental education occurs in order to prepare students for baccalaureate level instruction. Within the undergraduate level, developmental education enrollments account for a low of 0.7 percent of total undergraduate enrollment at the University of Maryland, Baltimore County, to a high of 9.61 percent of total undergraduate enrollment at Coppin State University. Detail of developmental education enrollment levels at each public four-year college or university is provided in Table 3.

Table 3. Public Four-Year Colleges and Universities
FY 2009

Program	Undergraduate FTES FY 2009	Developmental Education FTES FY 2009	Percent of Total FTES for Developmental Education FY 2009
Bowie State University	3,843.13	185.13	4.82%
Coppin State University	2,571.75	247.20	9.61%
Frostburg State University	4,271.60	34.70	0.81%
Salisbury University	6,641.48	-	0.00%
Towson University	16,367.30	105.60	0.65%
University of Baltimore	1,930.80	48.90	2.53%
UM, Baltimore	836.36	-	0.00%
UM Baltimore County	8,525.37	5.70	0.07%
UM, College Park	25,811.52	*	
UM Eastern Shore	8,277.00	275.90	3.33%
UM University College	13,421.63	274.70	2.05%
Morgan State University	6,607.90	359.10	5.43%
St. Mary's College of Maryland	2,057.92	-	0.00%
Total	**101,163.76**	**1,536.93**	**1.52%**

Source: Institutional Surveys performed by University System of Maryland and Maryland Higher Education Commission, July 2010

Developmental Education Costs

To collect cost data on developmental education delivered at each Maryland college and university, the workgroup designed an additional cost survey. After much discussion on how to capture costs focused on remedial and developmental education, the consensus of the group was that costs related to delivery of instruction and support services to students enrolled at the institutions should be collected and then converted to those incurred only by students enrolled in developmental education courses through the enrollment data collected through the first survey.

The group discussed the differences between the costs and delivery of developmental education at the community colleges and at the four-year colleges and universities. It was recognized that the needs and focus for developmental education vary greatly between the segments of higher education, and, in addition, will vary equally as greatly among different types of four-year institutions with significantly different missions as well as admission and student selection criteria.

The group concluded that using expenditure programs from within those expenditures identified as Education and General (E&G) expenditures would provide the best profile of expenditures made for developmental education at the institutions. The three programs of expenditures used are Instruction, Academic Support and Student Services. The template for the Cost Survey developed for the community colleges is provided as Appendix B. The data showing total costs attributable to the delivery of developmental education at each Maryland community college is provided in Table 4. These costs range from the lowest level of $779,557 at Garrett College to the upper level of $16.6 million at Montgomery College. To control for levels of enrollment, these costs were also

converted to the cost per full-time equivalent student (FTES) and run from the low level of $6,251.64 per FTES at Frederick Community College, to a higher level of $8,961.95 at Montgomery College.

However, cost levels for developmental education among the individual colleges are complicated by several factors not related to developmental education delivery, including demographic differences, ranges in professor salaries across the state, the number and different levels of developmental education being taught, and the percentage of students enrolled. Each of these factors also contribute to the different level of E&G expenditures across the state and a lower E&G per FTE does not necessarily correlate with one college being less or more efficient in delivering developmental education. Furthermore, the cost attributed to developmental education is less than 10% of the total budget.

Table 4. Community College Developmental Education Costs
FY 2009

Institution	Developmental Education FTES FY 2009	E&G Costs Attributable to Dev. Ed FY 2009	E&G per FTE Developmental Education FY 2009
Allegany College	235.63	$ 1,976,191	$ 8,386.84
Anne Arundel Community College	976.83	7,233,675	7,405.25
Baltimore City Community College	1,171.77	8,517,511	7,268.93
Community College of Baltimore County	1,620.05	11,212,855	6,921.30
Carroll Community College	353.33	2,552,480	7,224.07
Cecil College	215.00	1,667,970	7,758.00
College of Southern Maryland	323.80	1,869,261	5,772.89
Chesapeake College	238.07	1,739,945	7,308.54
Frederick Community College	399.73	2,498,967	6,251.64
Garrett College	108.93	779,557	7,156.49
Hagerstown Community college	351.80	2,257,762	6,417.74
Harford Community College	431.97	2,905,378	6,725.88
Howard Community College	561.40	5,015,428	8,933.79
Montgomery College	1,852.37	16,600,856	8,961.95
Prince George's Community College	1,039.57	6,528,085	6,279.60
Wor-Wic Community College	351.60	1,944,455	5,530.30
Total	**10,231.85**	**$ 75,300,376**	**$ 7,359.41**

Source: Institutional Surveys performed by Maryland Association of Community Colleges and Maryland Higher Education Commission, November, 2010

MHEC ran independent calculations of costs for the public four-year institutions consistent with the data submitted by the community colleges. In these calculations, MHEC used the breakdown of developmental education credit hours and FTES as a portion of Total FTES. However, recognizing that the focus was on developmental education for introductory baccalaureate programs, MHEC limited the enrollment to undergraduate credit hours and FTES. Next, MHEC pulled Unrestricted Expenditures for Instruction, Student Services and Academic Support for each institution and discounted them by the percent of undergraduate credit hours to total undergraduate credit hours at each institution. Finally, MHEC applied the percent of credit hours enrolled in developmental education as reported by each institution to the respective undergraduate E&G expenditures to determine the costs for developmental education. This provided the total and cost per student levels for developmental education as reported in Table 5.

Table 5. Public Four-Year Colleges and Universities
FY 2009

Program	Developmental Education FTES FY 2009	E&G Costs Attributable to Developmental Education FY 2009	E&G per FTE Developmental Education FY 2009
Bowie State University	185.13	$ 1,576,465	$ 8,515.45
Coppin State University	247.20	2,390,047	9,668.47
Frostburg State University	34.70	314,204	9,054.87
Salisbury University	-	-	-
Towson University	105.60	878,189	8,316.18
University of Baltimore	48.90	674,182	13,786.95
UM, Baltimore	-	-	-
UM Baltimore County	5.70	74,185	13,014.91
UM, College Park	*	*	*
UM Eastern Shore	275.90	2,177,541	7,892.50
UM University College	274.70	2,750,033	10,011.04
Morgan State University	359.10	3,173,823	8,838.27
St. Mary's College of Maryland	-	-	-
Total	**1,536.93**	**$ 14,008,669.38**	**$ 9,114.71**

Sources: Institutional Surveys, Institutional Budgets, University System of Maryland and Morgan State University

For the four-year institutions, there was a concern that the costs associated with developmental education were not as accurately reflected by this calculation as in the case of the community colleges. This is because undergraduate missions at 4-year public institutions are enormously more varied than at the community colleges and even at the institutions most heavily involved in developmental education it remains a relatively small portion of overall enrollment (see Table 3). First, the focus for developmental education was applied to undergraduate enrollments only, since the purpose of those courses are to prepare students to be able to perform in programs at the baccalaureate level. Second, the workgroup agreed that the developmental education needs at a Master's level university will differ greatly from the needs at a Research University. Further, the developmental needs at an institution that has very high admissions standards and selectivity whose student population has an average SAT score of 1,250 or above will also differ significantly from the need of a university that admits students whose academic preparation and performance levels are much lower.

As Table 5 shows, under MHEC's analysis, developmental education expenditures range from a low of $74,185 at UMBC to a high of $3.2 million at Morgan State. While these figures differ from the options provided by USM and MSU, the pattern of developmental cost levels among the institutions is relatively the same. The costs per student range from a low of $7,892.50 at UMES to a high of $13,786.95 at the University of Baltimore.

One point that should be emphasized is that while the cost per student at these institutions varies greatly depending upon the type of institution (UB being largely upper-division undergraduate and graduate level), the actual costs of providing the instruction and the participation level must be considered. For example, while the University of Baltimore shows the highest per student costs, it enrolls only 48.9 FTE students in these courses for total expenditures of $674,185. UMBC reports only 5.7 FTE students in developmental education for a total expenditure of $74,185. Morgan State, on the other hand, enrolls

359.1 FTE students at a cost per student of $8,838.27 and over $3.2 million in developmental education costs.

To account for the additional complexities between the public four-year institutions, these campuses provided alternative methods for determining the costs of developmental education. The first was provided by the University System of Maryland and are explained as follows: the overall approach used was to group institutions by level of developmental education activity. USM institutions varied from no activity at Salisbury University to 1 student in 200 at UMBC in developmental activity to a high level of 1 in 4 of students at Coppin State University. Broadly speaking the institutions fell into 3 groups: Low activity (0.0% to 0.2% of FTE equivalent), minimal activity (0.7% to 1.3%) and moderate activity (3.7% to 6.9%). These radically different levels of activity ensured that no single formula applied to overall cost were effective in determining cost. Therefore each institution which provided estimates of cost determined which factors were key elements of their developmental activities.

The resulting cost estimates provided by institutions in each of these groups suggested variation in cost based on intensity of the activity. Bridge and tutoring programs were included when they either were largely focused on students who might need developmental education (at HBU's in particular) or where the programs might not exist except that they serve the developmental student (UMCP). Comprehensive institutions tutoring programs which serve a variety of student populations were not generally included again at the decision of the institutions represented.

The following factors were included in the calculations by individual institutions in determining the cost of developmental education.

All institutions included:

- Instructional salaries (including lecturers for the courses and/or undergraduate teaching assistants)
- Faculty administrative support (e.g. a portion of department chairs release time)

Included when appropriate:

- Computer labs and technical support
- Instructional supplies
- Math, English and Writing tutoring
- Summer bridge programs

Added by UMCP:

- Campus overhead charge

The resultant data provided by USM are provided in Table 6. Each institution provided estimates of the level of expenditures for developmental education activity using the factors listed above. These costs range from the low level of $15,960 at UMBC to a higher level of $724,428 at CSU. The range per student is from $1,913 per FTES at Towson University to $3,390 at the University of Maryland Eastern Shore.

Table 6. University System of Maryland
Developmental Education Cost estimates

	Unduplicated Headcount in DE	FTE in DE	Percentage of Total FTE	Institutional Estimate	Cost per FTE per inst. Est.	Total
BSU	952	185.1	4.1%	$594,900	$3,214	$594,900
CSU	1033	219.4	6.9%		$3,302	$724,428
UMES	657	148	3.7%	$500,000	$3,390	$500,000
FSU	308	34.7	0.7%		$2,000	$69,400
TU	805	105.6	0.6%	$202,000	$1,913	$202,000
UB	295	48.9	1.1%		$2,000	$97,800
UMUC	2747	274.7	1.3%		$2,000	$549,400
UMBC	57	5.7	0.1%		$2,800	$15,960
UMCP	345	64.4	0.2%	$180,080	$2,796	$180,080
SU	0	0	0.0%		$0	$0
Total USM	**7199**	**1086.0**	**1.0%**			**$2,933,968**

* High capacity institutions are considered at 1/2 the average cost, lower capacity programs are credited at 1/3 the average cost, UMCP's cost is based on their institutional estimate

While the University of Maryland, College Park did not provide data on enrollment in developmental education through the institutional survey administered by MHEC and the workgroup, it did provide the following explanation of how developmental education is administered on its campus.

> "The only developmental courses that the University of Maryland offers are in mathematics. Students whose performance is weak on the math placement exam that all first-time, full-time students take as part of the orientation process are directed to either Math 003 or Math 01X. In fall 2009, 241 students enrolled in Math 003 and 288 enrolled in Math 01X. These numbers are down from fall 2008, when there were 301 and 345 students enrolled in the two courses, respectively.
>
> Students in Math 003 study intermediate algebra geared to a target credit course in their major. The course is structured into 36 lessons, which are self-paced, and computer-assisted. The class meets for six hours per week in a computer lab with an instructor and undergraduate lab assistant present. There are pre- and post-tests, three in-class written exams and a written final exam.
>
> Students in Math 01X choose a section geared to a credit-bearing content course. They meet five days a week for five weeks for intermediate algebra review, done as in-class small group activities with follow-up homework. After five weeks, they take the math placement exam in class. If successful, they move on to the related credit-bearing content course, continuing to meet five days per week with the same instructor, and using the syllabus and text that is used in the full semester credit bearing course. They take the same final exam as students who

have been in the full semester course. About 85 to 90% of students who start in Math 01X move on and complete the credit-bearing content courses at the same rate or at a slightly higher rate than those who begin the semester in the credit-bearing course. If students are not successful on the math placement exam at the five week point, they join an existing Math 003 class to more fully complete their review.

All of the Math 003 and 01X courses are self-support, paid for exclusively by a student fee charged directly to the student. The current cost to each individual student for fiscal 2010 is $280 per course. The course fee revenue pays for all costs associated with these courses, including but not limited to: computer labs and technical support from the Office of Information Technology, lecturers for the courses, undergraduate teaching assistants, faculty administrative support for each course (chair for course curriculum), instructional supplies, and a campus overhead charge which pays for use of campus facilities and administrative services (payroll, accounting, etc.)."

Morgan State University stated that its unique status as a smaller, Historically Black Doctoral Research Institution also merited an alternative computation of developmental education costs. It reiterated that its developmental costs should include costs related to faculty composition (regular vs. contractual), staffing, class size, counseling, advising, financial assistance and other components of instructional and support delivery. The university also stated that for Morgan, the developmental process does not end after remedial instruction, but is the beginning of an extended period of close monitoring, developmental interaction, and providing a significant level of financial assistance that, combined, have substantial cost implications for the University.

Following discussion that the goal of this effort to compute costs for developmental education was to attempt to capture those costs incurred to prepare entering undergraduate students with skills to perform at credit-bearing postsecondary course levels, the University provided three options for computing those developmental education costs. The scenarios are provided in Table 7.

Table 7. Morgan State University
Cost of Remedial Education: FY 2009
(Allocation of E&G Expenditures)

Option 1
(Remedial hours as a percent of undergraduate credit hours)

	Total E&G Expenditures	Remedial Hours	Total UG Hours	Percent	Remedial Cost
State Support	$ 72,784,293	10,773	198,237	5.43%	$ 3,952,187
Tuition and Fees	$ 47,513,028	10,773	198,237	5.43%	$ 2,579,957
Total	**$ 120,297,321**	**10,773**	**198,237**	**5.43%**	**$ 6,532,144**

Option 2
(Remedial hours as a percent of Total credit hours)

	Total E&G Expenditures	Remedial Hours	Total UG Hours	Percent	Remedial Cost
State Support	$ 72,784,293	10,773	213,582	5.044%	$ 3,671,240
Tuition and Fees	$ 47,513,028	10,773	213,582	5.044%	$ 2,396,557
Total	**$ 120,297,321**	**10,773**	**213,582**	**5.044%**	**$ 6,067,797**

Option 3
(Remedial hours as a percent of Total credit hours)

	Total E&G Expenditures	Remedial Hours	Total UG Hours	Percent	Remedial Cost
Total	**$ 105,699,471**	**10,733**	**198,237**	**5.43%**	**$ 5,739,481**

Source: Morgan State University

Costs of providing developmental education at Morgan State University under these options attribute the following levels: Option 1 shows a level of $6.5 million for Total E&G Expenditures from State Support and Tuition and Fees for Remedial Hours as a Percent of Total Undergraduate Hours. Option 2, Total E&G Expenditures from State Support and Tuition and Fees for Remedial Hours as a percent of Total Credit Hours estimates developmental costs of $6.1 million. Finally, Option 3 provides the lowest level of $5.7 million by calculating the portion of all Undergraduate E&G Expenditures for Remedial Hours as a percent of Total Undergraduate Credit Hours.

Part II. Promising Strategies in Developmental Education

This section of the report fulfills the second part of the Joint Chairmen's charge which required MHEC, in conjunction with MACC, USM and Morgan State University, to provide a review of best practices in developmental education throughout the nation as well as at Maryland's colleges and universities.

Introduction

An inter-segmental workgroup comprised of representatives from MHEC, the community colleges, Morgan State University and the USM central office, identified several promising strategies for effectively delivering developmental courses, and crafted policy and practice recommendations which are designed to support all developmental education programs. Prior to discussing the promising strategies and recommendations, several guiding principles which served as the framework for the workgroup's discussions will be outlined.

The purpose of all developmental education (DE) courses is to prepare students for college-level work. However, the context in which DE courses are offered affects the quantity, intensity, and mode of delivery of those courses. For example, the types of developmental courses that are offered at four-year campuses may differ from those offered at community colleges. Similarly, the type of DE that is most effective at moving recent high school graduates into credit-bearing mathematics may be very different from the type of developmental math offerings necessary to prepare older adults who have been away from the classroom for many years for college-level math. It is important to keep this point in mind because much of the conversation about developmental education focuses on those students who graduate from high school and are unprepared for college-level work. However, especially at the community colleges, a significant proportion of students enrolled in developmental coursework are returning adults who have been out of high school for at least two years. Data recently provided by the Community College of Baltimore County showed that 14 percent of students enrolled in developmental courses were at least 25 years old, and another 15 percent of developmental students were between the ages of 20-24. One could conclude that nearly one-third (29 percent) of developmental course-takers at CCBC had not been in high school for at least two years. While many of these students may have placed in developmental education courses even if they enrolled directly after high school, it is very likely that some of them lost a considerable amount of knowledge between the time that they left high school and the time that they entered the community college. For these students, developmental courses are necessary to help bridge their learning gaps.

Second, the workgroup decided not to focus on the needs of English for Speakers of other Languages (ESOL) students within the parameters of the developmental education discussion. Although these students are often required to take developmental courses, they have a unique set of needs and challenges which will be more thoroughly and appropriately addressed in an examination of strategies designed to enhance the academic progress of ESOL learners.

Finally, while this report will identify several promising strategies for delivering developmental courses, no single set of practices will work for every student or at every institution. This point is closely aligned with the previous assertion that the context in which DE programs are delivered matters. To this end, Schwartz and Jenkins (2007) suggest that, "educators ought to take a holistic approach to developmental education. Instead of focusing on a narrow set of interventions [they] should employ a range of instructional strategies and support services, and should ensure that all relevant instructional services and student supports are well-integrated with one another," (p.3). Therefore, the promising strategies that follow are presented with the understanding that they are most likely to yield the desired outcomes when they are implemented in a coordinated fashion.

Promising Strategies

Various Modes of Course Delivery

There are different ways in which developmental courses can be delivered, and as the introduction suggests, there is not a one-size-fit all approach that is most appropriate for all situations. Instead, developmental education faculty working collaboratively with their campus leaders must decide on the most effective DE instructional methods for their institutions given the particular needs of their student population. For example, it is clear that some students require multiple, semester-long developmental courses before they are ready to engage in college-level work. On the other hand, there are those students (typically those who score slightly below the threshold necessary for entering credit-bearing courses) who do not need a full DE course, but instead may be ready for college-level work after completing a refresher course or a few modules of the developmental course.

Research has also found that linking developmental courses with credit-bearing courses or student success or career development coursework can also be effective (Boylan, 2002). The strategy of linking courses is based on the principle that skills that are taught in one course and reinforced in another are more likely to be mastered and retained. Schwartz and Jenkins (2007) assert that students will learn more when, for example, "the content of a history course is used as the basis for an assignment in a developmental reading or writing course or when a problem solving skill acquired in a developmental course is successfully applied in a career course" (p.15).

Linked courses are often offered within the context of learning communities which provide a group of students the opportunity to take the same set of courses, which are typically organized around a common theme, together. When this strategy is employed, DE faculty use college-level course content to help frame their instruction, and faculty of the credit-bearing courses reinforce the basic academic skills that are taught in the DE classes.

The two strategies just described, linked courses and learning communities, are central components of the Community College of Baltimore County's (CCBC) *Accelerated*

Learning Project (ALP) which is designed for students who place in the highest level of developmental writing. *ALP* participants concurrently enroll in a credit-bearing English 101 course and a developmental writing companion course. The ALP sections of English 101 have eight seats which are designated for ALP students and 12 seats for students who place directly into credit-bearing English courses. The same eight ALP students also take the companion writing course together which meets immediately following the English 101 course. Both courses are taught by the same instructor. According to CCBC's website, *ALP* is the only program of its kind which simultaneously offers English 101 to basic writers and college-ready students. According to ALP faculty, combining students in this way, "is an important feature of our program. We do lots of group work in our writing classes, and we think it works much better in a section with some strong writers than it would in a section of all basic writers," (ALP, 2011a). There is also a sense that enrolling ALP students in the same English course as credit-bearing students decreases the stigma that is often associated with taking developmental courses.

The results of ALP are very encouraging. Among students who took the traditional developmental writing course in fall 2006, 59 percent passed the course, 37 percent enrolled in English 101 (the next credit-bearing course) and 27 percent passed English 101. However, among students who enrolled in ALP from fall 2007 to spring 2009, 77 percent passed the developmental course, 100 percent enrolled in English 101 and 63 percent enrolled in English 101 (ALP 2011b). These positive outcomes have made the *Accelerated Learning Project* a national model for the successful delivery of developmental writing.

Course Redesign

Course redesign, which is considered a best practice for successfully moving students through high-enrollment, entry-level courses, involves revamping the manner in which instructional material is delivered such that student achievement-levels increase while institutional costs decrease. Last year, MHEC highlighted course redesign as a way to accelerate success among underprepared students attending historically Black institutions. Now, course redesign is included as a strategy for improving student outcomes in developmental courses.

The National Center for Academic Transformation (NCAT) is regarded as a national leader in using redesigned postsecondary learning environments to achieve optimal levels of student success in entry-level and/or high-enrollment courses (Twigg, 2005). To this end, NCAT leaders have identified the following strategies as key components of successful course redesign models:

- **Online Tutorials** – interactive tutorials which provide students with the opportunity to practice core concepts, and offer students supplemental information when they need it to progress through the course material.
- **Continuous Assessment and Feedback** – automated response systems that support learning by instantly assessing students' homework assignments and quizzes, and which provide students with guidance on how to improve strategies and approaches to solving problems.

- **On-Demand Support** –the number and types of avenues that students can use to master course material are enhanced considerably. Typically, Undergraduate Learning Assistants (ULAs), rather than traditional faculty or graduate teaching assistants, are readily available to provide students with additional support when they need it most, such as when they are completing homework assignments.
- **Increased Interaction Among Students** – redesigned courses promote student engagement by encouraging more frequent interaction among students and ULAs.
- **Mastery Learning** – redesigned courses often provide a flexible format to support individualized student progress toward mastering learning objectives. Successful courses are generally not self-paced, but instead provide adequate structure to allow steady progress toward completion.

The University System of Maryland has engaged in course redesign as a part of its *Effectiveness and Efficiency Initiative.* As such, Coppin State University and Towson University launched pilot projects which focused on the redesign of their developmental math courses. The results of these projects revealed that Coppin decreased the number of DE math sections offered from 41 to 18, and reduced the costs associated with having adjunct professors teach these courses by 50 percent. Towson University saved 17 percent ($22,800) by shifting to the redesigned courses, and future enhancements are expected to reduce the original cost of delivering the DE math courses by 37 percent.

In 2005, the Tennessee Board of Regents launched a redesign of its developmental math and English curriculum. The goal of TBR's effort was to, "develop and implement a more effective and efficient assessment and delivery system that [would] increase completion rates for students, reduce the amount of time that students spend in remedial and developmental courses, and decrease the amount of fiscal resources that students dedicate to remedial and developmental education," (Twigg, 2007). The outcomes of Tennessee's redesign effort, which included five community colleges and one public four-year university, are laudable. At Austin Peay State University (APSU) the successful completion rate in the Level I and Level II developmental math courses increased from 33 percent to 71 percent, and from 23 percent to 54 percent, respectively. Additionally, APSU reduced the cost of providing developmental mathematics by 52 percent (from $402,804 to $193,556). At Cleveland State Community College, the number of students passing developmental math courses increased from 54 percent to 70 percent, and the cost of offering these courses decreased by 23 percent (from $270,625 to $219,258). Similarly, at Jackson State Community College, the overall student success rate in developmental math increased by 44 percent while the costs associated with providing these courses decreased by 22 percent (from $270,625 to $219, 258).

In 2009, Maryland was selected as one of seven states that received multi-year funding as a part of the Lumina Foundation for Education's productivity agenda. A major component of Maryland's plan is to launch a statewide course redesign project that will achieve improvements in student learning outcomes as well as reductions in instructional costs among participating institutions. Developmental education courses in mathematics and other "bottleneck" courses that institutions have identified as posing significant

challenges to student retention and progression will be a primary focus of the redesign effort.

Summer Bridge Programs

Summer Bridge Programs are a well-documented best practice in promoting academic success and persistence among underprepared students. On-campus intervention programs that take place before the official start of the academic year afford students a number of potential benefits, including opportunities to become acclimated to the campus, work through some first-year problems before the fall semester begins, receive academic support in areas of weakness, and become accustomed to the pace associated with college-level learning. For these reasons, Swail suggests that colleges support the development of academic bridge programs between the senior year of high school and the first year of college (Swail, 2004).

Recent data submitted by Bowie State University and Morgan State University suggest that their summer bridge programs are yielding positive results for students who are required to take developmental courses. Bowie State's *Bulldog Academy* is a five-week summer bridge experience for prospective students who show the potential to meet conditional admission standards. This program provides admitted students with a chance to complete their developmental requirements before the beginning of the fall term. At the end of their first academic year, students in the fall 2008 cohort who participated in the Bulldog Academy had a higher first-to-second year retention rate (78.5 percent) than the general population of first-year students (69.4 percent).

The summer bridge program sponsored by Morgan State University's Center of Academic Success and Achievement (CASA) has also had a considerable amount of success with moving students through their developmental courses. CASA is a six-week, alternative admissions program for students who fail to meet the University's standard SAT/ACT requirements for regular admission. CASA accepts up to 300 students each year, and all participants who successfully complete the program are guaranteed admission for the fall semester.

In fall 2008, 242 CASA participants enrolled at Morgan the following fall, and their first-to-second year retention rate was higher than the rate for all entering freshmen (70.2 percent vs. 68.6 percent). Furthermore, although nearly 100 percent of students in the fall 2008 and fall 2009 CASA cohorts required developmental coursework in math, English and reading, the rates at which CASA students passed these courses was unusually high and ranged from 95.5 percent to 100 percent over the course of the two years. While success rates in developmental math, specifically, are traditionally quite low, the fall 2008 and fall 2009 CASA cohorts defied this trend and completed their developmental math requirements at rates of 95.5 percent and 97.1 percent, respectively. Additionally, CASA students in both cohorts experienced much higher success rates in developmental math than either the 2008 (71.4 percent) or 2009 (71.1 percent) cohorts of all freshmen.

Coordinated Support Services

Institutions that most effectively prepare developmental students for college-level coursework offer a number of support services, which are coordinated across the campus, that address barriers to successfully moving through developmental courses. These services typically include advising, financial aid, counseling and a range of academic support options including tutoring, success skills classes, supplemental instruction and early warning notifications. Schwartz and Jenkins argue that, "student persistence increases with the number and extent of coordination of the services offered, their availability, and their responsiveness to personal needs and schedules," (p.16).

While the types of support services necessary to adequately support DE students can be expensive and labor intensive, they are necessary to not only ensure that students are successful in their developmental courses, but also to motivate students to actually enroll in those courses. Research shows that many students who place into developmental education classes never matriculate in the requisite courses. For example, in their study of developmental education courses at Virginia's community colleges, Roksa et al., (2009) found that, "most students did not complete recommended developmental courses – not because they did not pass the developmental courses that they took, but because they never enrolled in them to begin with. Only…50 to 60 percent of students referred to developmental education enrolled in the recommended developmental course," (p.3). Intensive advising which may include follow-up phone calls and emails, among other tactics, is necessary to ensure that students, why may be embarrassed or otherwise disenchanted with their placement in DE, to enroll in the necessary courses.

Recommendations for Policy and Practice

The best practices workgroup suggests that the following recommendations for policy and practice be carefully considered, and where applicable, implemented:

- ***Offering developmental courses at two- and four-year institutions***

While the vast majority of developmental courses are offered at the community colleges, it is important that DE courses continue to be offered in both the two- and four-year sectors. As previously mentioned, students who require developmental courses have a host of needs which range from several levels of intensive, semester-long DE courses, to refresher modules which can be completed in a few short weeks. The best practices workgroup members strongly agreed that students who require some remediation, but are otherwise prepared for college-level work should have the option of beginning their studies at either a two- or four-year campus. Further, while the implementation of the *College Success Task Force's* recommendations and the state's adoption of the Common Core standards are likely to reduce the need for remediation among recent high school graduates, some remediation will always be necessary because of the returning adult population. Although many of these students will begin their studies at a community college, for a wide variety of reasons, a four-year institution may be a better fit, and a more appropriate option, for others.

- ***Providing financial aid for developmental education courses***

Financial aid is an important tool in ensuring that students who require developmental courses can receive the training and education they need to advance their careers and/or improve their position in life. However, some campuses are shifting their lowest-level DE courses into the Adult Basic Education (ABE) program. Campuses that have contemplated this move argue that students whose placement scores fall below a certain threshold have very little chance of being successful in DE courses, and that it is therefore more appropriate to refer them to ABE where they can improve their skills, and prepare for entry into DE courses or continuing education courses that would allow them to enter a career that does not require college-level education. However, the issue with this approach is that ABE courses, which are usually housed in a continuing education department, are typically not eligible for financial aid. Therefore, DE students who are referred to ABE may be discouraged from enrolling in the necessary courses because of the financial burden associated with doing so.

One community college in Maryland has already started offering its lowest-level of DE courses through adult basic education, and others are considering doing so. However, the best practices workgroup recommends that all developmental education courses, even those for students with the lowest placement test scores, be eligible for financial aid, or that those students have access to other funding streams. For example, although Frederick Community College's reading course for students who place at or below the 6th percentile is offered through its continuing education department, the College has established a small scholarship through its foundation to support those students who do not have access to other funding sources. Proceeding in this manner ensures that students have the financial assistance they need to make progress toward their educational goals.

- ***Providing adequate support and professional development for DE faculty***

Developmental education faculty must possess strong content knowledge of their academic discipline as well as the ability to understand and address the special challenges and learning needs of their students. In fact, research suggests that, "having mastery over both the subject content they teach and the diverse teaching strategies shown to be successful with developmental education students can improve [DE] instructors' effectiveness" (p. 20). However, while there is a strong relationship between thorough faculty orientation and training programs, on-going professional development and effectively teaching developmental courses, there was consensus among members of the best practices workgroup that most DE faculty do not receive adequate support in these areas. Campuses must do more to ensure that DE faculty have access to the specialized training and support they need to effectively reach their students.

Additionally, DE faculty play an integral role at their institutions, and therefore should not be marginalized or isolated from their colleagues. This is particularly important given the need to facilitate the seamless transfer of students from DE to credit-bearing courses. To support students moving from developmental to college-level work,

Schwartz and Jenkins (2007) emphasize the need for "instructors [to] understand the role of their courses among developmental courses, among other courses in their discipline, and among credit-bearing courses in general," (p.20). Furthermore, since some campuses rely primarily on adjunct faculty to teach their developmental courses, steps should be taken to integrate these individuals into the institution as much as possible.

- ***Systematic collection and analyses of meaningful DE data***

To more effectively assist students with navigating their way through developmental education courses, more must be known about the methods that are producing the most positive results. Currently, the state only collects data on recent high school graduates who are placed in developmental math, reading or writing courses. Statewide data are not collected on returning or older students who are required to take DE courses, DE completion rates, enrollment or completion rates in credit-bearing courses, or retention and/or graduation rates for students who required developmental education.

The community colleges conduct a degree-progress analysis which examines outcomes based on students' levels of college-readiness at time of entry. According to the most recent degree progress data for the 2005 cohort, students who required developmental courses and successfully completed that coursework graduated, transferred or were still enrolled at a slightly higher rate (81.8 percent) than students who were considered "college-ready" upon initially enrolling (81.4 percent). However students who placed into DE courses and did not complete the requisite coursework had a much lower success rate than either of the other two groups (43.1 percent). The degree-persister rate, while insightful, is only provided by the community colleges. It would be helpful if the four-year institutions reported on a similar measure.

Collecting and analyzing data on trends and outcomes of students taking developmental education courses will allow effective practices, strategies and teaching methods to be more easily identified and replicated. For example, through the course of the workgroup's discussions, we learned that Frederick Community College offers a developmental science course (BI 55 – Preparation for Allied Health) which is designed to provide students who plan to enter the health professions with the fundamental background that they will need to progress through their science courses. Many students take BI 55 before enrolling in Anatomy and Physiology (BI 103) and Microbiology (BI 120). According to outcomes for fall 2010, 73 percent of students who enrolled in BI 55 earned a final grade of "C" or better in BI 103, and 52 percent of these students earned an "A" or "B". Additionally, approximately 75 percent of recent nursing graduates and current nursing students, have taken and successfully passed BI 55. Thus, the course serves as an important launch pad for those entering one of the state's critical workforce shortage areas. If data on all developmental courses were submitted and shared on a regular basis, other institutions, and their students, could benefit from the successful example provided by BI 55, as well as CCBC's Accelerated Learning Project. Undoubtedly, there are other such examples throughout the state that have not yet been discovered, but deserve to be highlighted. A more robust analysis and collection of developmental education data could reveal institutions that are more successful than

others at moving students through DE courses, or might highlight statewide patterns in developmental education that should be addressed or more closely examined.

Part III.

Lastly, this JCR response was also to provide a discussion of "institutions that are most successful at providing quality developmental education programs efficiently as measured by student progression and cost". To fulfill this portion of the charge, MHEC staff examined the cost data presented earlier in the report, as well as the degree progress analysis data which are collected annually by the community colleges. The four-year institutions do not systematically report on the long-term outcomes of students who take developmental courses and are therefore excluded from analysis.

Four of Maryland's community colleges spent less than $7,000 per FTE on developmental education and had successful persister rates for developmental completers of at least 80 percent. These colleges are highlighted in Table 8. While other colleges had either low developmental costs per FTE or high successful persister rates, they did not possess the important combination of both low costs and high student success rates which all campuses should strive to achieve.

Table 8. Developmental Education Costs and Successful Persister Rates at Selected Community Colleges

Institution	E&G per FTE Developmental Education FY 2009	Successful Persister Rates for Developmental Completers 2005 Cohort
Community College of Baltimore County	$6,921.30	80.1%
Frederick Community College	$6,251.64	88.7%
Hagerstown Community college	$6,417.74	83.8%
Harford Community College	$6,725.88	83.4%

Source: Institutional Surveys performed by Maryland Association of Community Colleges and Maryland Higher Education Commission, November, 2010, MACC Data Book

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Appendix A.

Worksheet for Developmental Education Enrollment
Institution (Please identify your institution here)
for Academic Year 2008-2009

Item	Description	Course ID	Total	Values and Calculations	
A	Unduplicated DE Students	MATH			
B	Unduplicated DE Students	ENGLISH			
C	Unduplicated DE Students	READING			
D	Unduplicated DE Students				
E	Unduplicated DE Students				
F	Unduplicated DE Students				
G	All DE Course Enrollments				
H	DE Hours of Enrollment - TOTAL			0.00	FTE
I	DE Hours of Enrollment	MATH		0.00	FTE
J	DE Hours of Enrollment	ENGLISH		0.00	FTE
K	DE Hours of Enrollment	READING		0.00	FTE
L	DE Hours of Enrollment			0.00	FTE
M	DE Hours of Enrollment			0.00	FTE
N	DE Hours of Enrollment			0.00	FTE
O	Total Undergraduate Credit and Equated Credit Hours of Enrollment			0.00	FTE
P	DE Proportion of Total Undergraduate		#DIV/0!		
Q	Average Number of DE Courses per Student				

Notes on Items, Descriptions, and Values

A	All students enrolled in a DE Math course are counted and duplicates are removed -- this number is the unduplicated count of individual students regardless of how many courses a student took. A student is only counted once even if she took four DE courses.
B	All students enrolled in a DE English course are counted and duplicates are removed -- this number is the unduplicated count of individual students regardless of how many courses a student took. A student is only counted once even if she took four DE courses.
C	All students enrolled in a DE Reading course are counted and duplicates are removed -- this number is the unduplicated count of individual students regardless of how many courses a student took. A student is only counted once even if she took four DE courses.
D	All students enrolled in a DE course other than Math, English or Reading are counted and duplicates are removed -- this number is the unduplicated count of individual students regardless of how many courses a student took. A student is only counted once even if she took four DE courses. Please indicate the subject of the course.
E	All students enrolled in a DE course other than Math, English or Reading are counted and duplicates are removed -- this number is the unduplicated count of individual students regardless of how many courses a student took. A student is only counted once even if she took four DE courses. Please indicate the subject of the course.
F	All students enrolled in a DE course other than Math, English or Reading are counted and duplicates are removed -- this number is the unduplicated count of individual students regardless of how many courses a student took. A student is only counted once even if she took four DE courses. Please indicate the subject of the course.
G	This is the number of enrollments in DE courses -- every student is counted for each course she took during the fiscal year -- if she took one course, she is counted once; if she took three courses, she is counted three times
H	This is the sum, for AY 2008 - 2009, of the Total credit and equated credit hours of enrollment in DE courses
I	This is the sum, for AY 2008 - 2009, of the credit and equated credit hours of enrollment in DE courses in Math
J	This is the sum, for AY 2008 - 2009, of the credit and equated credit hours of enrollment in DE courses in English
K	This is the sum, for AY 2008 - 2009, of the credit and equated credit hours of enrollment in DE courses in Reading
L	Please provide the sum, for AY 2008 - 2009, of the hours of enrollment in DE courses in other DE course and identify in "Course ID" column. *Add additional row for each Developmental Subject as needed.*
M	Please provide the sum, for AY 2008 - 2009, of the hours of enrollment in DE courses in other DE course and identify in "Course ID" column. *Add additional row for each Developmental Subject as needed.*
N	Please provide the sum, for AY 2008 - 2009, of the hours of enrollment in DE courses in other DE course and identify in "Course ID" column. *Add additional row for each Developmental Subject as needed.*
O	This is the sum, for AY 2008 - 2009, of all credit and equated credit hours of enrollment.
P	This is DE Hours of Enrollment Total divided by Total Hours of Enrollment.
Q	This is the average number of courses taken by students enrolled in DE Courses.

Appendix A.

Worksheet for Developmental Education Enrollment
Institution (Please identify your institution here)
AY 2008-2009

Fall Term

Item	Description	Course ID	Section 1	Section 2	Section 3	Section __	Section __	Section __	Section __	Total	Values and Calculations	
D	DE Hours of Enrollment	MATH								0	0.00	FTE
E	DE Hours of Enrollment	ENGLISH								0	0.00	FTE
F	DE Hours of Enrollment	READING								0	0.00	FTE
G	DE Hours of Enrollment									0	0.00	FTE
H	DE Hours of Enrollment									0	0.00	FTE
I	DE Hours of Enrollment									0	0.00	FTE

Spring Term

Item	Description	Course ID	Section 1	Section 2	Section 3	Section __	Section __	Section __	Section __	Total	Values and Calculations	
J	DE Hours of Enrollment	MATH								0	0.00	FTE
K	DE Hours of Enrollment	ENGLISH								0	0.00	FTE
L	DE Hours of Enrollment	READING								0	0.00	FTE
M	DE Hours of Enrollment									0	0.00	FTE
N	DE Hours of Enrollment									0	0.00	FTE
O	DE Hours of Enrollment									0	0.00	FTE

Summer I Term

Item	Description	Course ID	Section 1	Section 2	Section 3	Section __	Section __	Section __	Section __	Total	Values and Calculations	
P	DE Hours of Enrollment	MATH								0	0.00	FTE
Q	DE Hours of Enrollment	ENGLISH								0	0.00	FTE
R	DE Hours of Enrollment	READING								0	0.00	FTE
S	DE Hours of Enrollment									0	0.00	FTE
T	DE Hours of Enrollment									0	0.00	FTE
U	DE Hours of Enrollment									0	0.00	FTE

Summer II Term

Item	Description	Course ID	Section 1	Section 2	Section 3	Section __	Section __	Section __	Section __	Total	Values and Calculations	
V	DE Hours of Enrollment	MATH								0	0.00	FTE
W	DE Hours of Enrollment	ENGLISH								0	0.00	FTE
X	DE Hours of Enrollment	READING								0	0.00	FTE
Y	DE Hours of Enrollment									0	0.00	FTE
Z	DE Hours of Enrollment									0	0.00	FTE
AA	DE Hours of Enrollment									0	0.00	FTE

Summer III Term

Item	Description	Course ID	Section 1	Section 2	Section 3	Section __	Section __	Section __	Section __	Total	Values and Calculations	
AB	DE Hours of Enrollment	MATH								0	0.00	FTE
AC	DE Hours of Enrollment	ENGLISH								0	0.00	FTE
AD	DE Hours of Enrollment	READING								0	0.00	FTE
AE	DE Hours of Enrollment									0	0.00	FTE
AF	DE Hours of Enrollment									0	0.00	FTE
AG	DE Hours of Enrollment									0	0.00	FTE

Notes on Items, Descriptions, and Values

D, J, P, V, AB Please provide the credit and equated credit hours of enrollment in DE courses in Math for the Term indicated by Section. Please provide the information for each section for that subject, and provide it for as many sections as are provided in the year.

E, K, Q, W, AC Please provide the credit and equated credit hours of enrollment in DE courses in English for the Term indicated by Section. Please provide the information for each section for that subject, and provide it for as many sections as are provided in the year.

F, L, R, X, AD Please provide the credit and equated credit hours of enrollment in DE courses in Reading for the Term indicated by Section. Please provide the information for each section for that subject, and provide it for as many sections as are provided in the year.

G, M, S, AA, AE Please provide the credit and equated credit hours of enrollment in DE courses in other DE course and identify in "Course ID" column for the Term indicated by Section. Please provide the information for each section for that subject, and provide it for as many sections as are provided in the year.

H, N, T, AB, AF Please provide the credit and equated credit hours of enrollment in DE courses in other DE course and identify in "Course ID" column for the Term indicated by Section. Please provide the information for each section for that subject, and provide it for as many sections as are provided in the year.

I, O, U, AC, AG Please provide the credit and equated credit hours of enrollment in DE courses in other DE course and identify in "Course ID" column for the Term indicated by Section. Please provide the information for each section for that subject, and provide it for as many sections as are provided in the year.

Appendix B.

Worksheet for Estimating "Cost of Developmental Education"
_____Community College

Item	Description	Values and Calculations		
A	Unduplicated DE Students			
B	All DE Course Enrollments			
C	DE Hours of Enrollment		0.00	FTE
D	Total Hours of Enrollment at the College		0.00	FTE
E	DE Proportion of Total	#DIV/0!		
F	Current Fund Expenditures- Instruction			
G	DE Proportion (using DE % of hours above)			
H	Current Fund Expenditures - Academic Support			
I	DE Proportion (using DE % of hours above)			
J	Current Fund Expenditures - Student Services			
K	DE Proportion (using DE % of hours above)			
L	Costs Attributable to DE			
M	Instructional Cost per FTE for Developmental Education (Costs in Item L divided by DE FTE in item C)	#DIV/0!		

Notes on Items, Descriptions, and Values

The methodology here is to apportion expenditures for Instruction, Academic Support, and Student Services expenditures by the percentage of total college hours of enrollment that were Developmental Education

A	All students enrolled in a DE course are counted and duplicates are removed -- this number is the unduplicated count of individual students regardless of how many courses a student took. A student is only counted once even if she took four DE courses.
B	This is the number of enrollments in DE courses -- every student is counted for each course she took during the fiscal year -- if she took one course, she is counted once; if she took three courses, she is counted three times
C	This is the sum, for FY 2009, of the hours of enrollment in DE courses
D	This is from the CC-4, Exhibit XIII, Line 1 and represents the college's total hours of enrollment for the fiscal year.
E	This is the proportion of total hours of enrollment that DE course enrollments constitute -- it is the output of item C divided by item D
F	This is from CC-4, Exhibit II, Unrestricted General Current Fund, Expenditures by Function - Instruction
G	This is the proportion of F (Instruction) attributable to DE -- the result of E times F
H	This is from CC-4, Exhibit II, Unrestricted General Current Fund, Expenditures by Function - Academic Support
I	This is the proportion of H (Academic Support) attributable to DE -- the result of E times H
J	This is from CC-4, Exhibit II, Unrestricted General Current Fund, Expenditures by Function - Student Services
K	This is the proportion of J (Student Services) attributable to DE -- the result of E times J
L	This is the sum of costs apportioned to DE - the sum of items G - I - K
M	This is the "instructional cost" per FTE for Developmental Education - it is the result of dividing the instructional costs for DE (item L) by the FTE for DE (the FTE in item C)