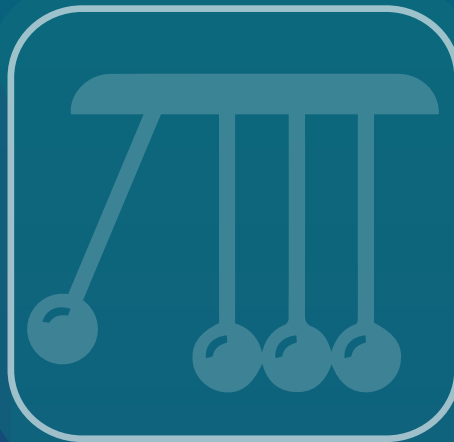


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Understanding Entry-Level Courses in American Institutions of Higher Education

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INTRODUCTION

This study analyzed a previously collected national sample of entry-level college course documents to establish an empirical understanding of entry-level college work in English/language arts, science, and social sciences. Whereas the findings were used most immediately to develop the content of a performance task bank that represents college- and career-readiness level work, the results offer a deeper understanding of the content, requirements, and challenge level expected in entry-level college courses in both two- and four-year institutions of higher education.

RATIONALE

The purpose of this study was to further the understanding of what it means for students to be college and career ready. College and career readiness currently is a top issue in American educational policy. This study used the following definition of college and career readiness:

Students who are ready for college and career can qualify for and succeed in entry-level, credit-bearing college courses leading to a baccalaureate degree, a certificate, or a career pathway-oriented training program, without the need for remedial or developmental course work. They can complete such entry-level, credit-bearing courses at a level that enables them to continue in the major or program of study they have chosen (Conley, 2013, p. 51).

Using this definition, what students need to succeed in entry-level college courses becomes a critical target for student preparation. By analyzing a national sample of credit-bearing (nonremedial) entry-level college courses from both two- and four-year institutions of higher education, the results of this study provide evidence of the expectations, skills, and challenge level students will encounter when they begin their postsecondary pursuits.

The historical disconnect between the two separate systems of secondary and postsecondary education within the United States creates a gap in student preparation (Venezia, Kirst, & Antonio, 2003). For example, more than 50% of students entering two-year colleges and nearly 20% entering four-year universities are placed in remedial courses (Complete College America, 2012). Each system

evolved in relative isolation with no clear articulation of the knowledge and skills students required for success at the subsequent level (Conley, 2005).

During the past decade, educators, researchers, and policymakers have worked to improve alignment between the secondary and postsecondary systems, using tools such as the development of standards for college and career readiness. This work began with the first ever set of college-readiness standards—the Knowledge and Skills for University Success (Conley, 2003)—and continues today with the Common Core State Standards (CCSS) effort supported by the National Governors Association (NGA) and the Council for Chief State School Officers (CCSSO) (NGA & CCSSO, 2010).

The stated goal of the CCSS is to define the knowledge and skills students should achieve in K–12 English/language arts and mathematics to graduate from high school ready to succeed in entry-level, credit-bearing academic college courses and in workforce training programs. A major question about the standards is the degree to which they reflect what is necessary to be ready for college and careers. To help address that question, Conley and colleagues conducted the 2011 study, *Reaching the Goal: The Applicability and Importance of the Common Core State Standards to College and Career Readiness* (Conley, Drummond, de Gonzalez, Rooseboom, & Stout, 2011). The study collected and examined a national sample of entry-level postsecondary course syllabi and instructor expectations to determine the degree to which the CCSS are applicable and important for postsecondary readiness.

Other national efforts, the National Survey of Student Engagement (NSSE) and the Faculty Survey of Student Engagement (FSSE), collected student and faculty responses from four-year colleges and universities about student engagement in educational practices that were linked empirically with student learning and development. The results provided an estimate of how undergraduates in four-year institutions spent their time and what they gained from attending college (NSSE, 2015). The results helped contextualize the NSSE findings and inform discussions related to teaching, learning, and the undergraduate experience (FSSE, 2015).

Using a different approach, researchers at the National Center on Education and the Economy (NCEE) conducted a study looking at the levels of mathematics and English language literacy high school graduates need to succeed in their first year in community colleges (NCEE, 2013). They randomly selected a community college from each of seven states and analyzed the most popular and diverse programs in the selected colleges. NCEE used subject matter panels to analyze the programs and a

technical advisory committee to oversee the work. In mathematics, the panel checked textbooks, exams, and other work products. In English, the panel analyzed graded student assignments, tests, examinations, and the reading levels needed to understand the textbooks used in the courses. The results indicated students performed at lower levels than would be predicted based on faculty surveys of what students should know and be able to do, and significant gaps exist between traditional high school curriculum requirements and entry-level community college performance requirements (particularly in mathematics).

The results of *Reaching the Goal*, the NSSE, and the FSSE were based on self-reported perceptions. This sample risks capturing what faculty would like students to know, rather than what they actually need to know. The NCEE study used a different data source in that it analyzed student work samples of student performance in entry-level college work. In contrast, the study reported here analyzed documented course expectations using an extant database of a national sample of entry-level course documents to conduct a course-content analysis (using the same sample as *Reaching the Goal*). The results of the current study help triangulate a deeper understanding of entry-level college courses by examining documented expectations and requirements.

Most recently, the results of this analysis were used to generate college- and career-readiness performance tasks directly aligned with current practice in entry-level college coursework. Performance tasks in thirteen different courses were piloted in college and high school classrooms. The results of this study, however, have broader implications beyond an empirically derived task bank. Whereas the disconnect between secondary and postsecondary education is unique to the American educational and political context, the identification of the requirements and expectations from a national sample of entry-level college coursework is significant for both domestic and international use and contributes to a deeper specification of postsecondary readiness.

RESEARCH DESIGN

This study was a course-content analysis of a national sample of entry-level college course documents. An emergent coding design determined the content, expectations, and attributes as documented in the course artifacts. The unit of analysis for this study was the course syllabus, supplemented by examples of entry-level course assignments and assessments.

Syllabi offer a significant source of data. A review of the literature points to the importance of syllabi in three domains of higher education: administrative, course development, and interpersonal (Eberly, Newton, & Wiggins, 2001). Administratively, syllabi function as a contract between the student and the university, and they are used in formal proceedings such as transfer equivalency and judicial hearings (Bers, Davis, & Taylor, 1996). For course development, syllabi serve to codify classroom practices, expectations, and norms (Danielson, 1996) and can be used to evaluate curriculum and program development (Ecker, 1994; Stanny, Gonzalez, & McGowan, 2015). Syllabi outline what objectives will be met, what topics will be covered, and when assignments and assessments will be due (Svinivki & McKeachie, 2010). For the interpersonal domain, a syllabus serves as an explicit means for communication and sets the rules and expectations for classroom conduct and supports (Eberly, Newton, & Wiggins, 2001).

Overall, syllabi provide detailed information about the expectations, policies, resources, and intended curriculum being taught. Assignments and assessments provided voluntarily by the participating instructors enabled secondary analysis. These additional documents helped to further unpack the implemented curriculum with examples of the types of activities and the challenge level students will encounter in entry-level courses.

DATA COLLECTION

This study analyzed a previously collected dataset. In 2010, researchers from the Educational Policy Improvement Center (EPIC) originally collected the course artifacts as part of the *Reaching the Goal* study. The sample of participants was determined using the Carnegie Classification of Institutions of Higher Education database (Indiana University Center for Postsecondary Research, n.d.) and included only two- and four-year public and private institutions of higher education (IHEs) located in the United States (excluding territories), resulting in the inclusion of 3,468 IHEs in the sample plan. The stratified sampling plan sought to replicate as closely as possible Carnegie's percentage breakdown in terms of whether private or public status, two- or four-year program length, institutional size, and geographic location.

After the universe of IHEs was identified, the recruitment process began. Project staff placed the names of the institutions on lists for each content area and then randomly sorted each list. Project

staff began contacting relevant liaisons (e.g., a chemistry department head to identify a chemistry instructor) according to their order on the list. The lists sometimes were reordered to prioritize certain school characteristics based on a close monitoring of the stratification criteria (e.g., selecting two-year institutions if four-year institutions were becoming over-represented, even if they were not the next on the list).

Table 1 describes the characteristics of the institutions of higher education that provided the course documents used in this study and compares this sample to the Carnegie database. For the three subject areas addressed in this study, the 2,210 documents analyzed were submitted from 773 IHEs, which reflects a representative breakdown of the actual composition of two- and four-year IHEs in the United States.

Study participants were recruited in two phases: first, a liaison from each institution was identified. These liaisons (department chairs, deans, provosts, and/or chief academic officers) then nominated instructors who either currently taught or had recently taught an entry-level course or courses for which the institution had been randomly selected to represent.

During the second phase, which began in April 2010, nominees were contacted via email and phone to inform them of their nomination and request their participation. Each instructor was required to upload at least one syllabus and was given the option to upload other course artifacts as well. The study team continued recruitment to complete the sample until December 2010. For this study, 2,210 artifacts were collected representing 1,218 courses in English, science, and social sciences from 773 institutions of higher education and from all 50 states and the District of Columbia. The fulfillment rate, or the percent of courses that had a survey completed after being nominated, ranged from 38% to 66% across courses, with an average of 52% (Conley, Drummond, de Gonzalez, Rooseboom, et al., 2011, p. 3).

The documents collected during the study are a compilation of syllabi, assignments, and assessments from common entry-level credit bearing courses in the subjects of English/language arts, mathematics, science, social sciences, and career and technical education (CTE). For this study, the authors analyzed only the course documents for the English, science, and social studies courses. Future studies will analyze the mathematics and CTE course documents.

Table 1. *Number of Institutions and Documents and Percentage of Overall Sample by Institutional Characteristic*

Characteristics	Study Sample IHE <i>n</i> (%)	Carnegie IHE ^a %	Documents <i>n</i> (%)
Institution Classification			
Private	304 (39.3)	48.4	836 (37.8)
Public	469 (60.7)	51.6	1,374 (62.2)
Degree Type			
2-Year	293 (37.9)	33.9	946 (42.8)
4-Year or above	480 (62.1)	66.1	1,264 (57.2)
Size			
Very small	94 (12.2)	18.1	320 (14.5)
Small	270 (34.9)	29.9	676 (30.6)
Medium	237 (30.7)	23.4	709 (32.1)
Large	119 (15.4)	11.4	327 (14.8)
Very large	15 (1.9)	2.1	78 (3.5)
Special-focus institution ^b	38 (4.9)	15.2	100 (4.5)
Region			
West	133 (17.2)	18.7	430 (19.5)
Southwest	90 (11.6)	8.5	272 (12.3)
Midwest	206 (26.6)	25.8	660 (29.9)
South	210 (27.2)	24.5	517 (23.4)
East	134 (17.3)	22.6	331 (15.0)
Total	773 (100.0)	100.0	2,210 (100.0)

Note. IHE = institutions of higher education.

^aDistribution of U.S. institutions of higher education as classified by the Carnegie Foundation (Indiana University Center for Postsecondary Research, n.d.). ^bCarnegie designation for institutions with concentrations of at least 75% of degrees in a single field or a set of related fields. This field was undersampled during data collection based on the assumption that these institutions may not offer all of the courses being sampled.

Although specific course titles may vary by institution, similar courses were grouped into course categories. Table 2 shows the total number of courses that were submitted and the number of artifacts analyzed by content area and course type. Overall, 2,210 documents were analyzed representing 1,218 courses from 773 different two- and four-year colleges and universities.

Table 2. *Number of Sample Syllabi, Assessments, and Assignments by Content Area and Course Type*

Course Type by Course Area	Documents			
	Syllabi ^a	Assessments	Assignments	Total
English/Language Arts	315	43	235	593
Composition I	133	14	100	247
Composition II	91	13	61	165
English Literature	91	16	74	181
Science	396	188	165	749
Biology	109	71	76	256
Chemistry	116	69	37	222
Physics	87	38	17	142
Anatomy and Physiology	84	10	35	129
Social Sciences	507	150	211	868
Intro to Economics	64	20	30	114
Intro to Psychology	99	32	66	197
Intro to Sociology	75	5	24	103
Statistics	90	44	39	173
U.S. Government	90	19	23	149
U.S. History	89	30	29	131
Total	1,218	381	611	2,210

^aThe number of syllabi also represents the number of courses. Unique courses were determined based on unique titles and course numbers supplied in syllabi.

Whereas the submission of a syllabus was required for all participants, the submission of assignments and assessments was voluntary. The sample of syllabi, therefore, is representative of the composition of IHEs in the United States; the sample of other course documents is not. The assignments and assessments were useful, however, for providing additional depth in the exploration of the expectations and challenge level for entry-level course work

DATA ANALYSIS

This study employed an emergent qualitative design to analyze each of these documents. Using an iterative review process and a pilot analysis, Table 3 represents the coding categories of data collection for the full analysis.

Each document was reviewed in two phases. First, a trained EPIC researcher addressed items about explicit course information such as whether the course had an attendance policy, how many papers were assigned according to the syllabus, and whether an assignment required individual or group work. Then, the document was scored by a content-expert consultant to address items that required pedagogical or content knowledge such as whether a course provided scaffolding and support for students according to the syllabus. This project ultimately engaged the services of 39 content-expert consultants from around the country in reviewing the course documents and completing accompanying surveys. The group of consultants comprised college and university professors with experience teaching the related course type for which they were reviewing documents. They were not required to be teaching the course concurrent with completing the reviews, although the majority was doing so.

Potential candidates were selected from EPIC's extensive content expert database based on demonstrated expertise and performance on prior studies; each received an email message detailing the work of the project and inquiring as to qualifications, interest, and availability. Once recruited, the 39 expert consultants were thoroughly trained on the coding categories and EPIC's online data collection tool. Survey questions that were deemed to require expert judgment were assigned to consultants; these included identifying the level of cognitive demand as defined by Marzano (Marzano & Kendall, 2007) and determining where assignments fell on the Novice–Expert Cognitive Progression, as defined by Conley (2013).

Table 3. *Coding Categories by Document Type*

Syllabus	Assessment	Assignment
Prerequisite courses	Cognitive demand	Group work
Sequent courses	Assessment type	Duration
Course length	Assessment length	Technological proficiency
Course frequency	Student instructions	Assignment type
Course assignments	Retake assessment	Assignment length
Course reading page count	Rubric incorporated	Problem set count
Course informational reading	Online assessment	Presentation length
Course literature reading	Assessment source	Presentation structure
Assessment count	Assessment scoring method	Group roles
Textbook count	Open-book assessment	Student instructions
Textbook list	Assessment duration	Writing type
Grading method	Cognitive progression	Mode of discourse
Grade weighting	Assessment location	Cognitive demand
Extra credit		Cognitive progression
Special needs provisions		Scaffolding
Scaffolding		Rubric incorporated
Course topics/units		Assignment location
Technological proficiency		Multiple drafts
Social media		
Course philosophy		
Scaffolding		
Late work policy		
Attendance policy		
Plagiarism policy		
Classroom conduct		
Credits		

Consultants also received the following reference documents to aid them in the review process:

- A data dictionary with defined survey terms
- Documents containing detailed information about Marzano's model of Cognitive Demand and Conley's model of Novice–Expert Cognitive Progression

The online data collection instrument included a series of survey questions, some designated for project staff, some for content experts, and some for both. In addition, the expert content consultants were asked to code the content covered within the syllabi. Project staff created initial lists of possible themes for each subject area by referencing Advanced Placement course descriptions available through the College Board website (<https://apstudent.collegeboard.org/apcourse>) and identifying content topics within the descriptions. In the cases of both Introduction to Sociology and Anatomy & Physiology, no equivalent AP courses were available to reference. Therefore, content-area experts drafted the initial theme lists based on their expertise and with guidance from project staff to create a consistent grain size, or level, of themes selected.

Content-area expert consultants then reviewed all data for their subject area using spreadsheets and selected themes based on evidence from the survey data. They were not required to use every topic from the initial list, and likewise the consultant experts were free to add or refine the list of topics if evidence did not fit any of the pre-identified themes. The consultant experts selected as many theme codes per course as data evidence supported.

Project staff then sorted the data to extract the top three most frequently found themes by course type. This information about most frequently used themes informed the development of subject-specific college and career-readiness performance tasks in a subsequent phase of this project.

Because EPIC researchers and content experts were responsible for different items, interrater reliability (IRR) analyses examined the consistency of coding separately for the trained EPIC researchers and the content-area expert consultants. In both cases, items were distributed using a not-fully crossed design. The 16 EPIC researchers reviewed 40 syllabi, 23 assignments, and 14 assessments for the purposes of the IRR study. The reliability document pool for consultants comprised 60 syllabi, 36 assignments, and 24 assessments. Fleiss's kappas (K) were calculated for categorical items. Linearly weighted Fleiss's kappas (K_w) and one-way, random effects intraclass correlation coefficients (ICC_1) were used to examine the reliability of ratings for ordinal or interval items.

For items coded by EPIC researchers, Fleiss's kappas were fair to almost perfect ranging from K values of 0.40 to 0.85 and intraclass correlation coefficients ranged from fair to excellent with ICC_1 values of 0.41 to 0.82 (Cicchetti, 1994; Landis and Koch, 1977). Weighted Fleiss's kappas suggest fair to almost perfect agreement for ordinal items ($K_w = 0.23$ to 0.86), with the exception of the number of readings assigned within syllabi ($K_w = 0.10$).

Content experts were fair to moderately consistent in noting the presence of instructional elements such as scaffolding, $K = 0.28$ to 0.51 (Landis & Koch, 1977). Experts varied by subject area in quantifying the number of reading assignments mentioned in syllabi by type (e.g., narrative, fiction, or nonfiction), with $ICC_1 = 0.05$ to 0.96 (Cicchetti, 1994). Across all subject areas, content experts were more consistent in rating cognitive demand (Marzano & Kendall, 2007) for assessments ($ICC_1 = 0.40$), than for assignments ($ICC_1 = 0.22$). This outcome may be influenced by differences in the degree to which information provided by assessments versus assignments indicate levels of cognitive demand.

High percentages of agreement, as much as 100%, occurred often when reviewers coded a lack of information in the document about the particular item. Prevalence has been shown to negatively affect IRR statistics (Byrt, Bishop, & Carlin, 1993). Within this study, we observed lower indices of interrater reliability mostly for items with little variance and high degrees of prevalence.

FINDINGS

The majority of the findings presented here are aggregated at the content-area level (e.g., English/language arts, science, or social sciences). However, the data for this study also were examined by courses, assessments, and assignments within the course categories (e.g., Composition I, Biology, or U.S. History). (For access to full results, submit a request to info@epiconline.org.)

Analysis of Course Syllabi

The analyses of course syllabi were the primary focus of this study. The findings provide descriptive information about courses aggregated at the content-area level (e.g., "the average number of minutes per week an entry-level science course meets is 259 minutes").

Course description. Tables 4 and 5 describe course duration, type of schedule, average number of days and minutes met per week, and the average number of course credits awarded for each subject area. The majority of courses were on a semester schedule (71.4%), and a combined 68.5% lasted 11 to 15 weeks or 16 or more weeks (see Table 4).

Table 4. *Duration of Courses (in Weeks) and Schedule Type Within Content Areas*

Duration and Schedule Type	Frequency (%)			
	English/ Language Arts	Science	Social Studies	Total
Duration of Course				
2–5 Weeks	3 (1.0)	4 (1.0)	9 (1.8)	16 (1.3)
6–10 Weeks	18 (5.7)	17 (4.3)	19 (3.7)	54 (4.4)
11–15 Weeks	116 (36.8)	152 (38.4)	184 (36.3)	452 (37.1)
16+ Weeks	100 (31.7)	119 (30.1)	182 (35.9)	401 (32.9)
Don't know	78 (24.8)	104 (26.3)	113 (22.3)	295 (24.2)
Type of Schedule				
Semester	222 (70.5)	293 (74.0)	355 (70.0)	870 (71.4)
Trimester	0 (0.0)	1 (0.3)	3 (0.6)	4 (0.3)
Quarter	13 (4.1)	27 (6.8)	25 (4.9)	65 (5.3)
Other	6 (1.9)	4 (1.0)	10 (2.0)	20 (1.6)
Don't know	74 (23.5)	71 (17.9)	114 (22.5)	259 (21.3)
Total	315 (100)	396 (100)	507 (100)	1,218 (100)

As presented in Table 5, courses on average met between two and three times a week across English/language arts ($n = 184$, $M = 2.46$, $SD = 0.80$), science ($n = 251$, $M = 2.75$, $SD = 0.95$), and social sciences ($n = 295$, $M = 2.57$, $SD = 0.87$) content areas but varied in the average number of minutes met per week. Science courses reported an average of 259 minutes ($n = 220$, $SD = 128.45$), English/language arts courses averaged 182 minutes ($n = 121$, $SD = 63.55$), and social science courses averaged 203

minutes but varied largely ($n = 208$, $SD = 223.08$). English/language arts and social science courses averaged 3.16 credits ($n = 89$, $SD = 0.50$) and 3.20 credits ($n = 162$, $SD = 0.47$), respectively. The average number of credits within the science content area was 3.88 ($n = 157$, $SD = 0.81$).

Table 5. Average Number of Course Days per Week, Minutes per Week, and Credits Awarded by Content Area

Content Area	Days per Week		Minutes per Week		Credits	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
English/Language Arts	184	2.46 (0.80)	121	182.33 (63.55)	89	3.16 (0.50)
Science	251	2.75 (0.95)	220	258.92 (128.45)	157	3.88 (0.81)
Social Sciences	295	2.57 (0.87)	208	203.25 (223.08)	162	3.20 (0.47)

Course policies. Table 6 describes the course policies included in the syllabi. Of the 1,218 course syllabi, approximately 36% of all syllabi listed prerequisite coursework ($n = 441$), while less than 5% noted sequent courses ($n = 56$). The majority of all courses included provisions for students with special needs ($n = 792$), provisions for scaffolding and student support ($n = 615$), and policies regarding attendance ($n = 998$), plagiarism ($n = 889$), and student conduct ($n = 774$). Policies allowing late work ($n = 487$) or extra credit ($n = 203$) were less common. Almost one-half of all courses expected students to be proficient with some form of technology ($n = 607$) and more than one-third expected students to use social media or online learning tools ($n = 540$).

Coursework. The examination of syllabi helped to better understand the type of assessments and assignments required in entry-level college courses (see Table 7). The most frequently represented assessment types across the 1,218 syllabi were exams/tests and finals, each mentioned in 56.5% and 60.1%, respectively. In all content areas, quizzes, oral exams, midterms, and other types of assessments each were mentioned in less than 25% of syllabi. Across the full sample of courses, only one syllabus mentioned an oral exam.

Table 6. *Frequency of Course Policies by Content Area (Percentage Within Content Area)*

Element	English/ Language Arts (n = 315)	Science (n = 396)	Social Sciences (n = 507)	Total (n = 1,218)
Prerequisite course specified	143 (45.4)	195 (49.2)	103 (20.3)	441 (36.2)
Sequent course specified	10 (3.2)	31 (7.8)	15 (3.0)	56 (4.6)
Provisions for students with special needs	213 (67.6)	249 (62.9)	330 (65.1)	792 (65.0)
Provisions of scaffolding and support for students	182 (57.8)	180 (45.5)	253 (49.9)	615 (50.5)
Expectations for proficiency in technology	177 (56.2)	184 (46.5)	246 (48.5)	607 (49.8)
Expectations to use social media or online learning tools	134 (42.5)	178 (45.0)	228 (45.0)	540 (44.3)
Attendance policy	279 (88.6)	313 (79.0)	406 (80.1)	998 (81.9)
Plagiarism policy	269 (85.4)	253 (63.9)	367 (72.4)	889 (73.0)
Student conduct policy	195 (61.9)	242 (61.1)	337 (66.5)	774 (63.6)
Allowance of late work	180 (57.1)	125 (31.6)	182 (35.9)	487 (40.0)
Option for extra credit	33 (10.5)	62 (15.7)	108 (21.3)	203 (16.7)

The most common type of assignments differed by content area. Of 315 English/language arts assignments, 79.7% required papers or essays, compared with only 8.1% of all science courses and 34.3% of all social science courses. Labs were the most common science course assignment (30.8%), followed by readings (16.2%) and other assignments (12.6%). Assignments within social science courses were more evenly distributed among several different types. Following papers or essays, 27.6% of social science courses required readings and 27.2% required other types of assignments.

Table 7. Frequency of Assignment and Assessment Types as Mentioned in Syllabi by Content Area (Percentages)

Type of Coursework	English/ Language Arts (n = 315)	Science (n = 396)	Social Sciences (n = 507)	Total (n = 1,218)
Assignments				
Papers or essays	251 (79.7)	32 (8.1)	174 (34.3)	457 (37.5)
Problem sets	2 (0.6)	25 (6.3)	23 (4.5)	50 (4.1)
Presentations	57 (18.1)	14 (3.5)	36 (7.1)	107 (8.8)
Observations	2 (0.6)	0 (0.0)	2 (0.4)	4 (0.3)
Labs	0 (0.0)	122 (30.8)	13 (2.6)	135 (11.1)
Reading	79 (25.1)	64 (16.2)	140 (27.6)	283 (23.2)
Projects	31 (9.8)	18 (4.5)	66 (13.0)	115 (9.4)
In-class assignments	11 (3.5)	15 (3.8)	13 (2.6)	39 (3.2)
Journals	29 (9.2)	2 (0.5)	9 (1.8)	40 (3.3)
Other	89 (28.3)	50 (12.6)	138 (27.2)	277 (22.7)
Assessments				
Quizzes	42 (13.3)	97 (24.5)	125 (24.7)	264 (21.7)
Exams and tests	48 (15.2)	298 (75.3)	342 (67.5)	688 (56.5)
Oral exams	1 (0.3)	0 (0.0)	0 (0.0)	1 (0.1)
Midterms	64 (20.3)	38 (9.6)	93 (18.3)	195 (16.0)
Finals	146 (46.3)	275 (69.4)	311 (61.3)	737 (60.1)
Other	29 (9.2)	30 (7.6)	15 (3.0)	74 (6.1)

Looking more closely at reading requirements (see Table 8), English/language arts courses varied largely in terms of the number of pages assigned ($n = 122$, $M = 568.95$, $SD = 448.54$). Science courses, on average, assigned 379 pages ($n = 109$, $SD = 150.10$), and social science courses averaged 518

assigned pages ($n = 187, SD = 273.36$). Out of 315 English/language arts syllabi that mentioned reading assignments, 235 syllabi required informational texts (74.6%) and 123 required literary readings (39.0%). The number of assigned readings varied by course, averaging between 14 and 15 for literary texts ($n = 123, M = 14.50, SD = 11.19$), and 6 to 7 for informational texts ($n = 235, M = 6.73, SD = 20.06$). None of the science courses within the sample required literary readings and only 13 of the 468 social science courses that provided information on text types assigned literary readings.

Table 8. *Number of Syllabi Specifying Course Reading Requirements and Average Quantity Assigned*

Reading Requirements	English/Language Arts		Science		Social Sciences	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
Books required	299	2.27 (1.57)	379	1.37 (0.61)	498	1.46 (1.17)
Pages assigned	122	568.95 (448.54)	109	378.71 (150.10)	187	518.22 (273.36)
Informational texts	235	6.73 (20.06)	328	2.10 (4.97)	468	3.18 (7.10)
Literary texts	123	14.50 (11.19)	0	—	13	1.23 (0.60)

Syllabi analysis included determining the weight to which finals, quizzes, projects, papers, presentations, homework, participation, extra credit, tests, midterms, or other graded elements contributed to the final course grade. Of the 228 science and 321 social science syllabi that provided enough information to determine contribution to the final grade, tests were the most heavily weighted (an average of 43% of the final grade), followed by finals (18%). Among the 213 English/language arts courses, papers had the highest average weight on the final grade (approximately 44%). See Table 9.

Table 9. Average Percent Contribution of Graded Elements to Final Course Grade

Graded Element	English/Language Arts		Science		Social Sciences	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
Final	153	11.89 (9.85)	198	17.82 (12.30)	265	18.29 (12.91)
Quizzes	131	5.90 (7.69)	182	8.43 (10.60)	218	9.32 (12.68)
Projects	124	6.85 (16.20)	155	1.46 (5.43)	209	5.13 (10.09)
Papers	181	43.95 (25.41)	156	1.23 (4.07)	226	13.58 (16.90)
Presentations	129	4.28 (7.04)	155	1.20 (6.59)	195	1.70 (5.04)
Homework	117	2.67 (7.57)	180	8.51 (10.07)	203	6.40 (10.26)
Participation	161	8.61 (8.20)	160	3.41 (6.65)	240	7.11 (8.07)
Extra credit	111	0.09 (0.95)	149	0.00 (0.00)	182	0.06 (0.74)
Tests	131	11.42 (11.42)	209	43.42 (23.89)	275	43.25 (26.37)
Midterm	125	4.79 (8.55)	157	4.37 (12.20)	209	9.26 (15.15)
Other	191	29.02 (27.90)	192	9.91 (18.90)	257	14.46 (19.58)

Content themes. Within each course type, we examined syllabi for evidence of specific course-content themes. Statistics courses were particularly consistent in the themes they addressed; 93.7% of all statistics syllabi showed “summarizing distributions of univariate data” and “probability,” while 92.4% addressed “constructing and interpreting graphical displays of distributions of univariate data.” By comparison, the three most frequently represented themes among English literature courses were identified within “reading British literature” (56.5% of syllabi), “literature as representative of eras” (47.1%), and “genre study” (34.1%). Table 10 presents the most frequent content themes for each of the 13 course types examined in this study.

Table 10. Most Frequent Content Themes Referenced in Syllabi by Course Type

Course Type by Content Area (Syllabi, n)	Theme 1 (Percent of Course-Type Syllabi)	Theme 2 (Percent of Course-Type Syllabi)	Theme 3 (Percent of Course-Type Syllabi)
English/Language Arts			
Composition I (105)	Expository writing (includes comparison/contrast, definition, narration, etc.) (76.2)	Argumentative writing (54.3)	Analytical writing (43.8)
Composition II (77)	Research skills (66.2)	Argumentative writing (64.9)	Analytical writing (63.6)
English Literature (85)	Reading British literature (56.5)	Literature as representative of eras (movements or time periods, 16th century, Romanticism, Victorianism, etc.) (47.1)	Genre study (34.1)
Science			
Anatomy and Physiology (74)	Skeletal system (59.5)	Muscular system (59.5)	Cellular level of organization (56.8)
Biology (102)	Cell biology (83.3)	Biological chemistry (69.6)	Energy flow (65.7)
Physics (73)	Kinematics (including vectors, vector algebra, components of vectors, coordinate systems, displacement, velocity, and acceleration) (76.7)	Newton's laws of motion (71.2)	Work, energy, and power (71.2)
Chemistry (102)	Atomic theory/structure (78.4)	Chemical bonding/molecular geometry (75.5)	Stoichiometry (70.6)
Social Sciences			
Intro to Economics (58)	Basic economics concepts (96.6)	Inflation, unemployment, and stabilization policies (62.1)	Financial sector (60.3)

Course Type by Content Area (Syllabi, <i>n</i>)	Theme 1 (Percent of Course-Type Syllabi)	Theme 2 (Percent of Course-Type Syllabi)	Theme 3 (Percent of Course-Type Syllabi)
Intro to Psychology (93)	Learning (84.9)	Biological bases of behavior (83.9)	Abnormal psychology (82.8)
Intro to Sociology (70)	Gender, family, and sexuality (72.9)	Social inequalities (70.0)	Race and ethnicity (67.1)
Statistics (79)	Summarizing distributions of univariate data (93.7)	Probability (93.7)	Constructing and interpreting graphical displays of distributions of univariate data (92.4)
U.S. Government (87)	Institutions of national government (92.0)	Constitutional underpinnings of United States government (86.2)	Political parties and elections (74.7)
U.S. History (81)	Civil War (49.4)	The Early Republic, 1789–1815 (46.9)	Colonial North America, 1690–1754 (45.7)

Examination of Additional Assessment and Assignment Documents

As part of this study, participants were invited, although not required, to submit assignments or assessments in addition to their course syllabi. The most frequent type of assessment of the 381 assessments submitted was multiple choice ($n = 210$). Among the 611 submitted assignments, presentations ($n = 258$) were the most common. However, the most frequent type of assignment and type of assessment differed by content area, as Tables 11 and 12 show.

Cognitive requirements. In addition, we examined the submitted assessments and assignments for the level of cognitive demand required (for definitions, please see Marzano & Kendall, 2007) and location on the Novice–Expert Cognitive Progression (for definitions, please see Conley, 2013). The average level of cognitive demand was between comprehension and analysis for both assessments ($n = 377$, $M = 2.33$, $SD = 1.10$) and assignments ($n = 588$, $M = 2.89$, $SD = 1.00$). Specific content area frequencies and averages can be found in Table 13. The total number of assessments representing each of the four designations along the Novice–Expert Cognitive Progression decreased from

declarative ($n = 259$), procedural ($n = 239$), conditional ($n = 131$), to conceptual ($n = 83$) within assessments. However, as presented in Table 14, this pattern was not consistent across all content areas and also differed slightly with respect to assignments. Procedural thought was required in more assignments ($n = 334$) than was declarative thought ($n = 328$).

Table 11. *Type of Question and Average Number Included in Submitted Assessments*

Question Type	English/Language Arts		Science		Social Sciences	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
Multiple choice	13	10.54 (7.36)	121	27.21 (23.50)	76	27.20 (19.12)
Essay	17	2.00 (1.58)	11	2.45 (1.21)	36	1.94 (1.33)
Matching	2	18.50 (12.02)	24	14.63 (13.85)	16	10.69 (6.52)
Short answer	22	16.64 (12.51)	72	12.21 (13.16)	75	10.53 (9.89)
Restricted response	6	21.17 (23.30)	24	5.25 (5.28)	17	10.76 (9.93)
Extended response	6	5.17 (2.40)	53	6.64 (5.53)	32	6.25 (7.28)
Problem Sets	0	—	54	5.74 (6.13)	26	5.35 (3.48)
Other	10	6.30 (3.59)	26	3.23 (3.71)	25	6.84 (8.69)

Table 12. *Number of Submitted Assignment Types*

Content Area	Investigation	Lab	Observation	Paper	Presentation	Problem Set	Project	Reading	Other	Total
English/ Language Arts	0	0	1	40	160	7	5	5	17	235
Science	1	48	2	30	10	2	68	4	0	165
Social Sciences	5	13	4	20	88	4	52	22	3	211
Total	6	61	7	90	258	13	125	31	20	611

Table 13. *Number of Submitted Assessments and Assignments Reflecting Each Level of Cognitive Demand*

Content Area by Document Type	Retrieval (1)	Comprehension (2)	Analysis (3)	Knowledge (4)	No Evidence/ Missing	<i>n</i>	<i>M (SD)</i>
Assessments	116	87	106	68	4	377	2.33 (1.10)
English/ Language Arts	7	6	18	10	2	41	2.76 (1.02)
Science	63	49	52	23	1	187	2.19 (1.04)
Social Sciences	46	32	36	35	1	149	2.40 (1.16)
Assignments	78	92	232	186	23	588	2.89 (1.00)
English/ Language Arts	8	33	97	84	13	222	3.16 (0.81)
Science	38	40	34	48	5	160	2.58 (1.15)
Social Sciences	32	19	101	54	5	206	2.86 (0.98)

Note. Levels of cognitive demand refer to definitions used by Marzano & Kendall (2007).

Table 14. *Frequency of Submitted Assessments and Assignments on the Novice-to-Expert Cognitive Progression*

Content Area by Document Type	Declarative	Procedural	Conditional	Conceptual	No Evidence	Document <i>n</i> ^a
Assessments	259	239	131	83	3	381
English/ Language Arts	29	30	23	10	1	43
Science	133	134	72	43	1	188
Social Sciences	97	75	36	30	1	150
Assignments	328	334	222	216	17	611
English/ Language Arts	117	136	126	100	11	235
Science	108	97	40	55	3	165
Social Sciences	103	101	56	61	3	211

Note. Novice–Expert Cognitive Progression refers to the definition used by Conley (2013).

^aEach document could have multiple elements, representing more than one level along the novice-to-expert progression.

Assignment Writing Requirements

Assignments were also examined for the type of writing and mode of discourse required (for definitions, please see Crawford, Galiatsos, and Lewis, 2011). As Table 15 shows, among the 611 course assignments submitted, the most common required writing type was informational or explanatory ($n = 372$). This requirement was consistent across all three content areas. The most common mode of discourse required across all assignments was analysis ($n = 289$), followed by description ($n = 230$). Analysis ($n = 139$) was the most common mode of discourse within English/language arts assignments, while definition ($n = 73$) and description ($n = 108$) were the most common modes among the 165 science and 211 social science assignments, respectively.

Table 15. *Frequency of Writing Types and Modes of Discourse in Submitted Assignments*

Writing Attributes	English/Language Arts (n = 235)	Science (n = 165)	Social Sciences (n = 211)	Total (n = 611)
Writing Type				
Argumentation	104	10	58	172
Informational/ explanatory	107	110	155	372
Narrative	22	11	24	57
Other	52	3	25	80
Not applicable	4	29	16	49
Missing	17	12	4	33
Mode of Discourse				
Definition	38	73	75	186
Description	63	59	108	230
Procedural–Sequential	25	33	21	79
Synthesis	78	41	64	183
Analysis	139	49	101	289
Comparison	56	26	48	130
Evaluation	61	29	64	154
Problem–Solution	14	35	28	77
Cause–Effect	21	31	21	73
Other	33	2	9	44
Not applicable	5	28	14	47
Missing	20	7	3	30

Note. Each assignment could represent multiple writing types or structures.

The most frequent type of assignment submitted also was examined at the course-type level, and Table 16 displays those results. Papers were the predominant assignment type for all three English/language arts courses, as well as most social science courses (i.e., Intro to Psychology, Intro to Sociology, U.S. Government, and U.S. History). The average number of pages required for papers varied by course type, ranging from 2 to almost 6 pages. For all other courses, with the exception of Biology, problem sets were the most frequent assignment type submitted. Chemistry problem sets contained approximately 20 items per assignment, whereas the number of problem set items averaged between 8 and 11 items in all other course types for which a problem set was the most common type of assignment.

Table 16. *Frequency and Length of the Most Common Type of Assignment Within Each Course Type*

Course Type	Assignment			Assignment Length ^c			
	Type	<i>n</i>	% Within Course	<i>n^b</i>	Median	<i>M</i>	<i>SD</i>
English/Language Arts							
Composition I	Paper	85	85.0	43	3.00	3.40	1.62
Composition II	Paper	46	75.4	26	4.00	5.15	2.29
English Literature	Paper	29	39.2	18	4.00	3.89	1.53
Science							
Anatomy and Physiology	Problem set	22	62.9	22	9.00	10.23	6.09
Biology	Lab	29	38.2	2	1.00	1.00	—
Chemistry	Problem set	16	43.2	16	20.00	19.75	15.06
Physics	Problem set	10	58.8	8	5.00	7.88	7.45
Social Sciences							
Intro to Economics	Problem set	19	63.3	18	9.50	9.17	3.94
Intro to Psychology	Paper	36	54.5	29	2.00	2.07	3.92

Course Type	Assignment			Assignment Length ^c			
	Type	<i>n</i>	% Within Course	<i>n</i> ^b	Median	<i>M</i>	<i>SD</i>
Intro to Sociology ^a	Paper	8	33.3	7	5.00	5.71	3.59
Statistics	Problem set	17	43.6	15	10.00	11.02	7.41
U.S. Government	Paper	17	73.9	16	5.00	5.44	2.80
U.S. History	Paper	22	75.9	18	2.00	2.61	1.69

^aPaper and Other tied as the most frequent assignment type. Because Other comprises various types of assignments, the information presented is specific to Paper. ^bSample restricted to assignments that provided length information. ^cLength is the number of problems within a problem set assignment or the number of pages required for all other assignment types.

DISCUSSION

The findings of this study help reveal the expectations students will encounter in entry-level college courses in English, science, and social sciences. Traditionally, discussions related to postsecondary expectations have been anecdotal (such as, “this is what I had to do when I was a freshman in college” or “this is what I teach in my course”). This study offers empirical data to inform future discussions and decisions. For example, these data could be used when considering the reading requirements, and the types, lengths, and cognitive demand of assignments required in upper-division high school courses.

The findings also provide more specificity about individual course requirements in comparison to other studies examining college and career readiness issues. For example, the NSSE surveys students about their cumulative experience in college, versus individual course expectations examined in this study. Two other smaller studies examined course syllabi at single institutions of higher education. The first study identified the elements included in a sample of general education course syllabi at one university (Eberly et al., 2001) and determined what information was present or not present in the syllabi versus quantifying the expectations documented within the syllabi. The second study examined undergraduate writing assignments at one Canadian college, thus providing a small-scale comparison

to the writing results in this national sample from the United States. The Canadian study found that, on average, 2.5 writing assignments per course were assigned, and almost one-half of all assignments were four pages or less in length (Graves, Hyland, & Samuels, 2010). In comparison, the results of the study described in this article provided more nuanced findings, in which papers were not the only assignment type analyzed and were only the most common assignment type for 6 of the 13 course types. Also, among the courses in which papers were the most common assignment, the average required length varied from approximately three to six pages depending upon the course (see Table 16 for the full results). This finding also demonstrates how the results of this study could be used for international comparisons.

Another interesting implication of this study relates to the issue of the level of cognitive demand (rigor) expected of students entering college. This study is consistent with the NCEE findings for English literacy that the work currently required in initial credit-bearing courses in community colleges typically requires lower levels of cognitive challenge levels. NCEE found that most of the student work samples were at the retrieval level (NCEE, 2013, p. 16). The current study found similar results in science and social science courses, with the mode of the assessments at the retrieval level. Similar to NCEE, this study also found that the English courses, compared with the other content areas, required higher average cognitive demand levels in both assessments and assignments.

For a point of comparison of the cognitive demand levels, EPIC conducted another study analyzing the Depth of Knowledge (DOK) levels of the Common Core State Standards (Conley, Drummond, de Gonzalez, Seburn, et al., 2011). Figure 1 illustrates the results of the analysis of the distribution of the DOK levels for the English/language arts CCSS. In summary, the majority of the English/language arts CCSS are at DOK level 3, strategic thinking (55%), with an additional 26% at DOK level 4, extended thinking. This outcome translates to 81% of the standards being at levels 3 and 4. In contrast, the findings in this study also suggest a variance in the levels of cognitive demand students will encounter, but it is skewed toward the lower levels of cognitive demand, with more than one-half the assessments (54%) requiring DOK levels 1 or 2. The CCSS represent the current target of what students need to know and be able to do when they leave high school in 42 states (Common Core State Standards Initiative, 2015). This target raises important questions: Is current entry-level college course work at lower levels of cognitive demand because of the preparation levels of the students graduating under the previous K–12 systems' standards and expectations? As the CCSS are implemented and more students demonstrate proficiency on the CCSS, will the entry-level college expectations increase accordingly?

In the states that have adopted the CCSS, are institutions of higher education self-reflecting on the current content of their entry-level courses to be aligned with this new target, enabling students a more seamless transition from secondary to postsecondary learning settings?

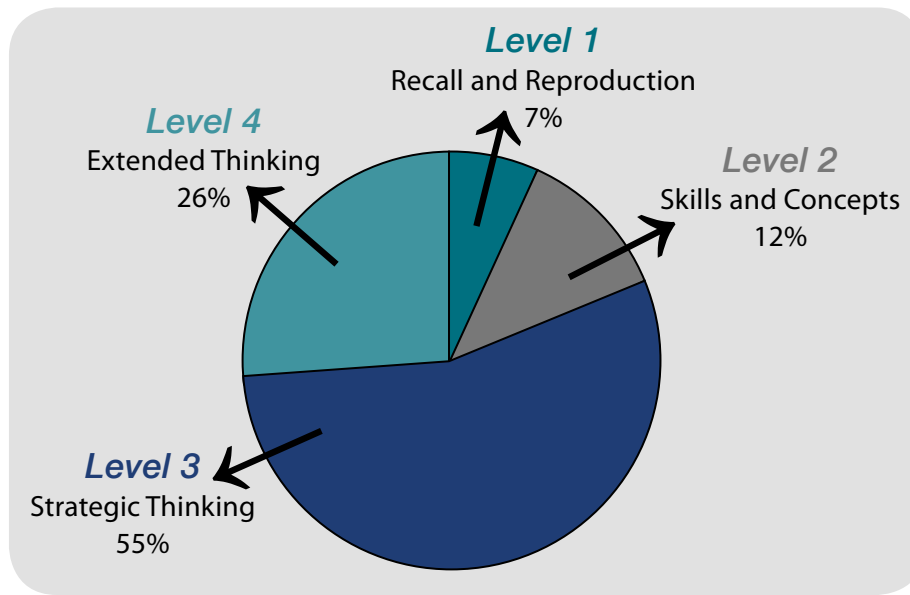


Figure 1. Depth of Knowledge (DOK) Level of Common Core ELA Standards.

A few limitations of this study should be noted. The syllabi analyzed for the primary portion of this study are a representative national sample of entry-level college courses. The focus of this study was to describe the expectations, requirements, and the cognitive challenge levels within entry-level courses across two- and four-year institutions. Although examinations of these data for differences between two- and four-year, entry-level courses were not the intent of this particular study, future research that considers institutional demographic differences may enhance the understanding of entry-level course expectations by institutional type. In addition, further exploration of differences in requirements and expectations by career aspirations and majors would be helpful to individualize student preparation. Finally, because the assessments and assignments were provided voluntarily by only a subset of respondents, readers should use caution in interpreting data with respect to generalizing findings based on these document types. Future studies examining such documents from a nationally representative sample of entry-level courses would provide greater insight into this area of research.

Overall, our hope is that these results will help contribute to a deeper understanding of the preparation students need to be successful when they graduate from high school. This information is intended for use in conjunction with other sources of information (e.g., faculty and employer surveys and student work samples) about what students need to know and be able to do when they leave high school. The hope is this information will be used to inform changes in standards, curriculum and instruction, assessment, and graduation and admissions decisions at both the secondary and postsecondary levels to help ensure that schools are preparing students for what they need to be successful when they leave high school.

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