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College Majors Scorecard™

Administrator's Guide

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Introduction

The goal of the *College Majors Scorecard (CMS)* is to sharpen the focus of current and potential college students on the area of study they would like to pursue. Based on a series of questions, the *CMS* is designed to guide the user toward one or two college majors that match most closely with their abilities, knowledge, and expectations. The *CMS* also looks beyond majors to fields of employment. The user is then directed toward an educational information database in the form of the *College Majors Handbook*, which contains information from the actual labor market experiences of more than 100,000 college graduates from 60 college major fields of study. The *CMS* is designed to be self-scoring and self-interpreting. It takes approximately 20 to 30 minutes to complete.

Need for the Instrument

The total cost—in money and time—of attending college is one of the largest expenditures that students will incur over their lifetime. Similar to any investment, college attendance involves incurring a large expense in the present with the expectation of future gains in the form of income, career, lifestyle, and satisfaction.

The average annual tuition and fees charged to full-time undergraduates in 2006–2007 was \$22,200 at 4-year private colleges, \$5,800 at 4-year public colleges, and \$2,300 at 2-year public colleges. Including room and board, the cost was nearly \$13,000 at 4-year public colleges and more than \$30,000 at 4-year private colleges (College Entrance Examination Board, 2006). In addition to these monetary costs, the completion of a bachelor's degree requires a minimum of 4 years of full-time attendance. Given these high costs—both monetary and non-monetary—the decision to go to college and what to study while in college must be grounded in reliable information.

The *CMS* is intended to help with this very important investment decision. It is a fact that two good students attending the same college and taking the same number of courses during the same time period will earn different annual incomes based upon what majors they study. The choice of major is ultimately a choice of potential careers. The *College Majors Handbook*, for example, illustrates how the graduates in one major reported that 88 percent of them stayed in the same field and did not seek out other employment; whereas in another major, 25 percent worked in jobs unrelated to their college education.



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Of course, the decision is not all about money. Life satisfaction derived from being able to meet one's values is an important aspect of the college major decision. The choice of a college major reflects one's personal characteristics. This reinforces the need for tools that students can use to help them focus on areas of study and/or majors that would be a good fit for their abilities, interests, and values.

Herr, Cramer, and Niles (2004) state: "A majority of freshmen will change their major field at least once during their collegiate experience. Indeed, this phenomenon is to be expected, for the first two years of study at most colleges and universities are so structured as to allow students to explore academic experiences.... Thus, the choice of a major field of study is a fateful one in regard to whether or not it provides an adequate 'fit' with a student's interests and aspirations. If not, the likelihood is that the student will seek a better fit in another curriculum or remain undecided." (p. 464) The goal of the *CMS* is to offer people another way to determine an adequate "fit" rather than relying merely on interests. Instead, the *CMS* uses one's ability to do something with confidence to determine that person's "fit" for both a college major and the potential career paths that it leads to.

Many college students today are poorly prepared to make this important educational decision. Brown (2003) suggests that "advising is the backbone of the educational planning process in postsecondary institutions." (p. 370) However, he notes that not all students perceive the need for this assistance, often leading to rushed and poorly thought-out decision making.

In addition, Luzzo, president of the National Career Development Association (2007), cited that "school counselors often do not have the resources... requisite for providing the types of career exploration and planning activities (useful) in schools." Both students and counselors alike would benefit from additional tools to help them make an informed decision regarding students' course of study.

The *CMS*, then, is designed to help fill this need. It enables students to focus on their ability to do major-related activities, their confidence in their ability to do the activities, and whether they can get satisfaction from doing the activities. The *CMS* graphically captures and records these observations and guides students to apply their results to their choice of major.

Background and Development

The content of the *CMS* is based on important knowledge and skills associated with an area of study and/or major. Ability, and not interest, is the primary basis for matching a person with a field of study. The *College Majors Scorecard* uses three rating criteria to match a person with a college major: the self-perceived ability to do an activity, confidence in one's ability to do that activity, and expected satisfaction from doing the activity.

Related to most fields of study are occupations that college majors prepare people to enter; for example, the accounting major primarily prepares people to be accountants. After examining the National Survey of College Graduates Database, a list of occupations was selected in which college graduates from a variety of major fields of study were working. The skills and knowledge associated with and required in these occupations were then obtained from the U.S. Department of Labor's (2006) *Occupational Outlook Handbook (OOH)*, the most comprehensive and reliable national source of skills and knowledge associated with a specific occupation. Items were then drafted based on work activities described in the *OOH* that incorporate these skills and knowledge.

The *CMS* uses work-related activity statements as the source of its content rather than the subject matter studied in academic courses. The work-related activities represent "real life" specific tasks that a worker does repeatedly, so an individual should like, be good at, and value them to remain employed. Subject content is more general and variable with instructors and institutions.

No attempt was made to simplify language used in activity statements. The fact that items use field-specific language or jargon is intended to gauge a student's familiarity and confidence level with the activities associated with that field. Thus, familiarity with field-specific terms is one determinant the assessment uses to help match students with majors. As a result, the activity statements are longer than those used in other career instruments.

The criteria used to develop the activity statements for each major were as follows:

- The most important activities associated with each major were identified.
- The skills and knowledge required for occupations most commonly linked to each major were clearly defined.
- The activity statement presented the work scenario in a positive and interesting manner.

The length of the *CMS* was determined by the motivation of users to read all statements and provide discriminating answers. Three illustrations of activities were thought to be a more reliable basis for selecting a major than one or two illustrations. After the items were developed, they were reviewed and edited for clarity, style, and appropriateness for measuring confidence and satisfaction levels with regard to specific majors and fields of study. Items were additionally screened to eliminate any reference to gender, race, culture, or ethnic origin.

Initial testing yielded information about the appropriateness of items for each of the college majors, reactions of respondents and administrators concerning the inventory format and content, and reactions of respondents and administrators concerning the ease of administration, scoring, and profiling of the *CMS*. Based on this information, items were again edited for clarity and length and instructions were streamlined for ease-of-use.

The source of the majors used in the *CMS* began with the 122 fields of study used by the U.S. Census Bureau in its 2003 *National Survey of College Graduates*. The authors reduced these fields of study into 60 majors so that there would be a sufficient number of graduates within a major to make reliable statements. The rationale for 49 *CMS* majors was to create 7 balanced broad fields of study each with 7 representative majors. Some related majors were combined to ensure adequate coverage. Still, administrators should be aware that while the most common majors are covered, not every possibility is represented. In addition, different schools may have different names for the majors identified on the *CMS*.

In addition to differentiating among 49 individual majors, the *CMS* scores confidence levels in 7 general study areas. The homogeneity of major fields within different colleges within a university influenced the organization of the following seven areas: Medical Science, Humanities and Social Sciences, Behavioral Sciences and Education, Computer Science and Engineering, Communications and The Arts, Physical and Life Sciences, and Business. This allows students who may not have high confidence in a specific major to at least identify a general study area in which to focus their coursework during their exploration of potential majors.

Students, whether high school or college, can judge whether in their current coursework they possess work-related skills and knowledge associated with a major. While the *CMS* uses self-estimates, the presence of course grades can offer corroboration of proficiency. Students can then use their results to help them focus on fields of study they would like to pursue further and potential majors to study within those fields.

Similar Instruments

The following descriptions (Whitfield & Feller, 2008) show how the *CMS* is unique in its construct and items, timeliness, and ease-of-use.

The *College Major and Vocational Program Selector*, published by COIN in 1990, is designed for grade 11 to college sophomore students. "Part I is a self-assessment that helps students to identify characteristics about themselves and relate personal characteristics to more than 600 college majors and vocational programs. In Part II, students match themselves with a Personal Orientation and select the matching college majors or vocational programs." (p. 450).

The *College Major Interest Inventory*, published by Consulting Psychologist Press in 1990, is designed for high school students to adults. "Designed to assist students in the educational decision-making process. Yields percentile scores on 70 scales, including 33 educational clusters, 13 school and college, and 6 general educational area scales. Must be machine scored." (p. 450).

The *CMS*, by contrast, does not rely on interests but on knowledge and abilities as a means of predicting congruity between an individual and college majors. Likewise, the instrument is self-scoring and self-interpreting, making it more time-efficient and easier to use.

Evidence

The items on the *CMS* have validity support from the U.S. Department of Labor's occupational specialists. Because the items were based on activity statements drawn from the *Occupational Outlook Handbook* and use language associated with occupations directly related to the college majors and fields of study represented, the *CMS* provides a direct correlation between students' perceived knowledge, abilities, and satisfaction and the college majors that lead to those occupations. The *CMS* authors have set a score of 9–12 as a high degree of match between one's confidence level and a college major.

The *CMS* was field tested in nine states: Colorado, Florida, Iowa, Kansas, Massachusetts, Mississippi, Missouri, Texas, and Virginia with 196 four-year college and university students and 169 two-year community college students. Seventy-seven percent of the 4-year college and university students rated the *CMS* as being worthwhile or very worthwhile. Among 2-year community college students, 71 percent rated doing the *CMS* as being worthwhile or very worthwhile.

Research Findings

Field testing of the *CMS* was designed to address four essential research questions, the results of which follow. Before taking the assessment, students were asked to identify their intended major. Students were given the option to choose “undecided.”

Research Question 1: Was there a corresponding match between one's *intended* major and the competency and self-satisfaction ratings of knowledge and skills?

The results showed an overall moderate relationship when only the students' highest *CMS* score was considered. When the next highest *CMS* score was also considered, the match rate was high in many fields of study. Table 1 shows the rate of congruence between an individual's intended major and his or her highest *CMS* score for each of the 7 fields of study covered on the *CMS*.

Table 1: Congruence Between Intended Major and *CMS* Highest-Scored Major

Field of Study	4-Year Colleges	2-Year Colleges
Medical Sciences (N=71)	72%	61%
Humanities/Social Sciences (N=11*)	64%	64%
Behavioral Sciences/Education (N=61)	79%	76%
Computer Science/Engineering (N=29)	55%	61%
Communications and The Arts (N=22*)	41%	41%
Physical and Life Sciences (N=16*)	50%	50%
Business (N=38)	80%	75%

* The sample was combined due to small size.

Research Question 2. In making a decision about a major, was it a simple matter of knowing one's best competencies in an intended major?

It was surprising to see that for approximately 4 out of 5 people, their knowledge and skills related to an *intended* major had competition (equally high scores) from 3 to 4 other majors. Using a positive psychology interpretation of this finding, the majority of people are multi-potential: They have the ability to succeed in a variety of majors, as well as a variety of career paths. The ultimate choice of a major involves complex decision-making beyond the cognitive mastery of the material leading to competence in an occupation associated with that major. This verifies that the *CMS* has value as an exploratory tool, often identifying additional possibilities while affirming an individual's perceived strengths.

Table 2: Match Between Intended Major's Highest Obtained Score and Other Majors at the Same Highest Score

Field of Study	4-Year Colleges	Avg. # of Addl. Major Options	2-Year Colleges	Avg. # of Addl. Major Options
Medical Sciences (N=71)	80%	3	83%	3
Humanities/Social Sciences (N=11*)	80%	4	80%	4
Behavioral Sciences/Education (N=61)	86%	4	88%	3
Computer Science/Engineering (N=29)	80%	7	88%	6
Communications and The Arts (N=22*)	77%	4	77%	4
Physical and Life Sciences (N=16*)	67%	3	67%	3
Business (N=38)	70%	4	86%	4

* The sample was combined due to small size.

Research Question 3: When uncertain about their preferred major, where should students look for other majors to explore?

Field testing results indicated students should first look at majors in the same field of study (see Table 3). Results also suggested that students should look at related fields of study; for example, many students who selected nursing also had strengths in the education area, especially in special education. Those in the engineering area had indicated strengths in the science area. Humanities or liberal arts majors often indicated communications talents. This approach did not work as well for Humanities/Social Sciences and Communications and The Arts.

Table 3: Congruence Between Intended Major and Highest-Scored Field of Study

Field of Study	4-Year Colleges	2-Year Colleges
Medical Sciences (N=71)	77%	78%
Humanities/Social Sciences (N=11*)	36%	36%
Behavioral Sciences/Education (N=61)	75%	76%
Computer Science/Engineering (N=29)	64%	83%
Communications and The Arts (N=22*)	23%	23%
Physical and Life Sciences (N=16*)	44%	44%
Business (N=38)	70%	79%

* The sample was combined due to small size.

Research Question 4: Do undecided students have a different pattern of options in choosing a major than students who have committed to a major?

Do undecided students only have a single option or do they have the same multi-potentiality of other students? The findings show that 2-year college students more frequently had selected one major with a high score, which was true for 1 out of every 3 students. However, overall undecided students had the same number of options as all other students. (See Table 4.)

The distribution of the fields of study with the highest obtained *CMS* scores revealed that Medical Sciences, Business, and Behavioral Sciences/Education had the most undecided students. The fewest undecided students occurred in the Communications and The Arts, Physical and Life Sciences, Computer Science/Engineering, and Humanities/Social Studies.

Table 4: Percent of Undecided Students with Multiple Highest-Scored Majors (N=84)

		Average Number of Additional Major Options
4-Year Colleges	88%	4
2-Year Colleges	65%	3

Administration

The *CMS* can be self-administered and the inventory booklets are consumable. A pencil or pen is the only other item necessary for administering, scoring, and interpreting the assessment. The assessment is intended for any high school student, college student, or adult who is interested in attending college. It can be used with individuals or groups. It is written at a 9th grade level overall, though the reading level of individual items fluctuates due to the terminology associated with that particular field of study. The *CMS* takes between 20 and 30 minutes to complete.

Administrators should be aware of the relationship of any assessment to the career planning process. The *CMS* is a tool which implements a 7-step career planning process set forth by Niles and Harris-Bowlsbey (2005). To be effective, an assessment must

- Alert one to become aware of the need to make a career decision
- Help one learn or reevaluate vocational self-concepts
- Encourage one to identify occupational alternatives

- Ask for information about identified alternatives
- Seek a tentative career choice
- Expect that an educational choice be made
- Present a thought-out and written plan to be implemented

The *CMS* is designed to fulfill all of those functions within the context of choosing a college major.

Recommended Administration Process

The first page of the inventory contains spaces for Name, Date, Gender, and Age. Instruct each respondent to fill in the necessary information. Also instruct them to write their name and the date in the spaces indicated on the last page of the *CMS*, which will later be detached for scoring purposes. Then read the description and directions on the first page while all respondents follow along.

Explain the importance of identifying a major that is a good fit and that leads to preferred occupational pathways. Also explain that the *CMS* is not designed to choose a major for the student, but to help them explore their options and make a more informed decision for themselves.

In **Step 1**, respondents rate their confidence level for each of the 147 statements. Test administrators should ensure that each respondent clearly understands all of the instructions and the response format. Be sure to check participants' understanding of the scale on page 2 to rate their competence on the 147 activities. Instruct respondents to mark all of their responses directly on the inventory booklet.

The evaluation scale has four positions: Poor Fit, Unsure, Moderate Fit, and Good Fit. The judgment criteria involve an assessment of ability, confidence, and satisfaction:

- **Poor Fit**—does not have the ability to perform the activity
- **Unsure**—has the ability but lacks confidence in the ability
- **Moderate Fit**—has the ability and confidence to do the activity, but satisfaction may be in doubt
- **Good Fit**—has the ability and confidence and feels the activity would be satisfying

It should be noted that the *CMS* response options reflect self-efficacy beliefs that Betz, Borgen, and Harmon (1996) equate with vocational confidence. According to social cognitive career theory (Lent, Brown, & Hackett, 1994), self-efficacy indirectly influences both choice action (which

is the act of choosing a major) and choice goals (which is the aspiration to pursue a particular career path, such as to be a teacher). Self-efficacy beliefs are personal (not parental) beliefs and are preliminary to making personal decisions to attend college and what major to study. "Self-efficacy and outcome expectancies then impact the development of interests, which in turn influence career goals and, subsequently, choice actions." (Larson, Wei, Borgen, & Bailey, 2007). Thus, CMS response ratings, e.g. good fit, convey additional information than just a person's preference for a certain major.

In **Step 2**, respondents total their confidence levels for each of the 49 majors. Each major is comprised of three activity statements. Adding the scores for each statement yields a confidence rating between 3 and 12.

Instruct respondents to detach the perforated scorecard (the last page) from the assessment booklet. This will make it easier to score each item. Each item (set of three activity statements) corresponds to a particular major and is color-coded on both the assessment and the scorecard for ease of scoring. When they have finished adding their totals for each of the 49 majors, they can then add each of the seven columns to derive their scores for the general study areas. Those scores will range from 21 to 84 and are recorded in the lightly shaded boxes at the bottom of the scorecard.

In **Step 3**, respondents interpret their scores and use their confidence and satisfaction levels to determine majors to explore further. High scores (9 to 12) on individual majors indicate a high confidence level and a preference for that major and the occupational paths it leads to. Respondents who are uncertain about their choice of major and who don't express high confidence levels in any of the individual majors can instead use their results to identify general study areas of interest. High scores (63 to 84) indicate a high confidence level in that general study area. Step 3 provides space for respondents to record up to 3 majors they wish to explore and consider further.

It is critical that the administrator allow adequate time (10 minutes) to complete Step 3. Failure to include Step 3 in the administration undermines the value of the instrument.

In **Step 4**, respondents are given instructions for using the *College Majors Handbook* and other resources to learn more about their preferred college majors and the career paths they lead to. A worksheet is provided to record the results of the respondent's research, compare college majors of interest, and outline college coursework and career plans.

A respondent may say he or she wants to explore a major not included on the *CMS*. The *CMS* can still be used to confirm this student's choice by identifying the college or school most likely to offer that major and comparing it to the respondent's highest-scored general study area. For example, someone looking to major in Women's Studies might see a high score in Humanities/Social Sciences as a confirmation of that choice. The respondent should still be encouraged to research that major using the guidelines offered in the *CMS*.

Use in a Group Setting

The *CMS* functions well as a tool for self-discovery and is useful for generating discussion. It is not intended to be a crystal ball, but is better suited as an exploratory exercise, designed to help students focus their options in order to make more informed decisions.

Listening to what respondents identify as important factors in making their decisions can be valuable for helping them choose a college major. If you administer the *CMS* in a group setting, try to allow time to let respondents discuss their results with each other. Some people will be surprised how dependent their friends are on parents' wishes; some will be impressed by how studious individuals have been in the process of making their choice; others will realize how little time they have given to their choice of major. This process is valuable in understanding how personal beliefs can impact this decision.

Using the *College Majors Handbook*

Step 4 of the *CMS* encourages respondents to research the majors that interest them. Doing so will help confirm the results of the assessment as well as get students to start thinking about their postsecondary plans. While the majors identified by the assessment allow for further research using almost any reference on college majors, the *CMS* is intended to be used specifically with the *College Majors Handbook*, a definitive guide to the 60 most common college majors and the career pathways they lead to.

The *Handbook* is based on data collected by the U.S. Bureau of the Census for the National Science Foundation and contains information on the college coursework, employment, earnings, duties performed on the job, job title, work values, and job satisfaction of college graduates from each of 60 major fields of study. Each of the 49 majors represented on the *CMS* is referenced by the *College*

Majors Handbook. Instructions for using the *Handbook* with the results of the assessment are provided in Step 4. In addition, you can use the worksheet on the last page of this administrator's guide along with the *Handbook* to help students engage in more in-depth research.

The decision of a college major must be based on a sound informational base, which the *College Majors Handbook* provides. With all the money and effort going into receiving college degrees, asking what happens *after* you earn the degree is important. Everyone can benefit from the similar stories many parents tell. "My son's girlfriend went to a prestigious liberal arts college with tuition of \$25,000 per year. A year after graduating, she now works as a waitress and she has enrolled to take courses at the local community college." The *College Majors Scorecard* coupled with the *College Majors Handbook* guides students beyond anecdotal observations with real life information about what happens to college graduates after they earn their degrees in different fields of study.

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Eight Questions to Help Decision-Making

The following questions can be used to collect information about different majors to help in the decision-making process:

1. What courses and skills will I accumulate in this major? Am I good at them? Do I like them?
2. Where do graduates of the major work? Is the work related to the major?
3. What are the work activities done by graduates of this major during a typical work week?
4. What additional education or training is typically acquired by graduates of this major?
5. What is the importance of certain work values among graduates of this major?
6. What is the average salary earned by graduates of this major?
7. What might my job satisfaction be? For example, the average economics major spends more than 2,200 hours per year working. Are they satisfied doing what they do?
8. What will the employment outlook be for the typical occupations in which graduates of this major are employed?